

Playing Jazz in the GRC Club

The “Future Perfect” of Governance,
Risk and Compliance



John Coyne
Thei Geurts

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Introduction

Managing and executing governance, risk & compliance in the 21st century requires many of the same talents as a jazz ensemble. However, contemporary organizations try to be more like an orchestra. An orchestra is a streamlined machine that practices the execution of a well-defined piece of work and expels all ambiguity. It doesn't like continuous - and certainly not unforeseen - change. In jazz, like in the real world of financial services, there is always room for ambiguity and flexibility. It is, in fact, the nutrient for customer-centricity, operational excellence and uniqueness.

In actual practice, organizations in heavily regulated industries are, at present, not able to play like an orchestra, let alone play like a jazz ensemble. The complexity they are dealing with is too overwhelming. They are not able to integrate new regulations and frequent changes in regulation successfully in their environment. There is no robust and resilient alignment between regulation, business motivation, operation and evaluation. They are faced with a cacophony of sounds of ad hoc trials and advice about what to do. Nothing works. It's time to try something different.

In this book, we present a GRC value proposition and GRC value architecture that marks the difference between the old way of supporting knowledge-intensive processes in heavily regulated industries and the new way of surviving and being successful in a volatile and uncertain future. We also explore the supporting technology that is needed to achieve this position and the transformational impact of the change stakeholders in heavily regulated industries are facing.

We want to thank Arian Verbeek for his contribution to the GRC framework architecture, Willem Dicou for his contribution to the governance-as-a-service chapter and, Francesca Vonk-Hagethorn for redesigning our illustrations.

John Coyne, Thei Geurts

June 20, 2013

Management summary

This publication contains two narratives. The narrative in the first chapter asks the question “Do you remember when compliance was a burden for you?” Instead of futilely complaining about everything that makes our life complex and troublesome, we start by describing a future situation in which this question is fully legitimate. This leads to an intriguing perspective of what is needed to become an “entrepreneur of meaning” in the GRC space. We describe an actionable framework and the underlying principles that allow you to break the vicious spiral in which you are caught. The result is a GRC intelligence position in which you and your engaged workforce are able to face the pace of regulatory change, smash bottom-line costs, increase top-line revenue and profitability and - most importantly - restore trust. And your compliance issues? They will be over, because you are compliant by design.

The narrative is purposely kept very basic, and presents the overall view of a GRC framework without going into too much detail. For a more in-depth understanding, the readers may go to the second narrative in the following chapters and pick the topics that are of interest to them.

In Part II, John Coyne takes this innovative perspective of GRC to a broader and deeper level. John provides the signposts for organizations to handle regulatory overload, realize real-time regulatory oversight, deal with emergent complexity, and work together in spontaneous networks. In Part III, we describe the concept computing technology that is now on the market to enable the described solutions. This innovative technology is about to cause a real paradigm shift in the world of heavily regulated industries. In Part IV, we focus on a practical solution to the multiple islands of similar activities taking place in regulated businesses across the globe. In the last chapter, the two narratives come together. Part V explains why you need to play jazz when addressing the topic of transformation, and how to realize the co-existence of the old and the new. It also summarizes the business case for embarking on the transformational journey.

Lastly, the appendix contains an anthology of observations and points of pain in the GRC space and solutions based on the presented vision.

Part I: Do you remember when compliance was a burden?

Introduction

There is a wonderful construct in solution-focused therapy called “future perfect”. In a business environment, we often refer to it as “the dot on the horizon” or the “to-be” situation. Its main function is to take a step back and look at your situation from a higher, analytical and objective perspective. This is inherently connected to achieving a deeper understanding of the real causes of your current problems. It enables you to develop a transition path to the new future. If we take that approach and apply it to the governance, risk & compliance (GRC) domain, something interesting happens: a new perspective on GRC emerges.

A new perspective So we should not complain about the gap between strategy and execution, non-authorized decisions or backward-mirror-oriented checks and controls. At this stage, we should also not elaborate on regulatory complexity, managing credit, knowledge, legal and other risks, the increasing cost of compliance or how to address integrity issues, but focus on the “future perfect” of your GRC environment. Then we might have another kind of conversation.

How to notice the difference Suppose you were a C-level representative of a highly regulated industry, e.g. of a financial institution, and I were to ask you, “What would happen if you awoke tomorrow and all your compliance problems had vanished? How would you notice the difference?” What would your answer be?

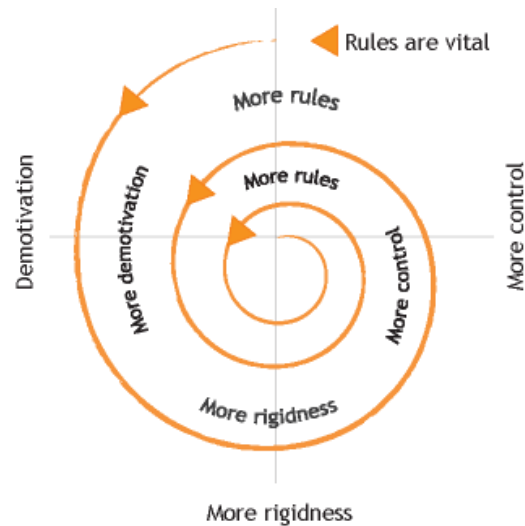
Break the vicious spiral

You would understandably perhaps need to make up your mind first, and probably buy some time with remarks like, “An intriguing question. We indeed mostly focus on all the elements that are holding us back.”

Vicious compliance spiral You might continue with, “We are stuck in a vicious compliance spiral. I will try to answer your question and

explain how we broke that spiral. But before I answer, allow me to explain what I mean by governance, risk & compliance and how I position my compliance issues.”

Figure 1: The vicious spiral



Source: based on the Crozier bureaucracy spiral

Then you would probably say, “There is an OCEG definition that reads as follows: GRC is ‘the capability to reliably achieve objectives (governance & performance) while addressing uncertainty (risk management) and acting with integrity (compliance).’”

Understanding decisions

You might continue by stating, “For me, there is an important strategic component in GRC, dealing with business objectives and performance, balancing investments according to our desired direction and desired results, setting decision rights and resulting policies.” You refer to leading analysts who claim that understanding and articulating which decisions must be made, by whom, how and when, and ensuring that policies are aligned with legal requirements and business objectives, are all key parts of the decision-making aspect of governance (Short & Caldwell, 2012).

“However,” you say, “GRC also involves setting risk tolerances for external and internal risks and being capable of dealing in time with unexpected events. This requires that processes and procedures be in accordance with policies and within the tolerances to support decisions. That covers the risk management aspect. Finally, the compliance and assurance

aspect of GRC is about establishing measures to monitor adherence to policies and decisions.”

A systemic perspective “So,” you conclude, “solving compliance problems is not an isolated issue, but a systemic one. It is only possible if I take the whole GRC ecosystem into account.” I would probably nod affirmatively and then continue with my question. “Fine, and what would happen if you awoke tomorrow and all your compliance problems had vanished? How would you notice the difference?”

Trust drives your “future perfect”

“Okay,” you say. “I would almost certainly see a flourishing profitable business, with a strong performance, solid growth, great elasticity, engaged employees, and we would all enjoy our work. But do you want to know how exactly I would notice the change that took place?”

It all boils down to trust “My answer is that, in my ‘future perfect,’ I would notice that we had restored the confidence of society and the government that we have lost in this present crisis of values. In the end, it all boils down to trust, doesn’t it? Ultimately, our profitability depends on it.”

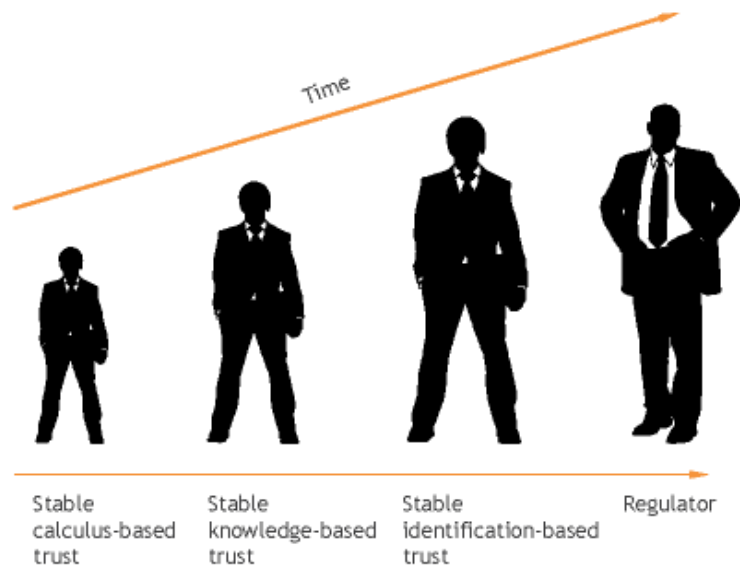
“Yes. That makes sense,” would be my reaction. My next question would then be: “So how would you notice that trust had been restored, and how would you be able to foster and maintain that trust?”

Knowledge-based trust You would probably give two examples. “First, the government has reduced our regulatory burden in the sense that we are certified to act in a higher division of trust,” you tell me. “Initially, we were forced to act like we were under a contract. Many checks, controls and reports were required and we had a lot to explain and prove. Now we have reached a knowledge-based trust level (Kramer & Tyler, 1996) in which our organization and our contracted partners are proven compliant.”

“Regulatory agencies audit and have approved the way we organize our GRC processes. They have real-time access to our knowledge base, in which we maintain the life cycle of regulations, risk tolerances, policies and controls.” You smile and add, “Naturally, they do not see the organizational

strategy, goals, objectives and internal metrics that we have seamlessly connected to these rules.”

Figure 2: The trust growth path facing regulators



Source: Kramer & Tyler. Trust in Organisations, 1996

Real-time oversight

“On the other hand, regulatory agencies may have real-time oversight of the way we have executed controls in our transactions, using the shielded access and standard reporting and notification features we provide. In more and more cases, we even have an open invitation to act at the highest level of trust. We are partnering in defining new regulations, shaping the way that fits our industry and discussing the results of our impact assessments before government decisions become active.”

You are a regulator yourself

Secondly, you provide me with an example that clarifies how you are now able to maintain that trust in a highly cost-effective way. You tell me that at some point in time you realized that you are, in essence, a regulator yourself. “The same level of trust that is expected from me externally, and is enforced upon me, has to exist between me and my board, our business units and the partners in our network.”

“That has led to some important choices,” you tell me. “We have devised a structure that ‘connects all the dots’ and enables end-to-end governance and transparency. So we have connected regulatory alignment, risk alignment and business alignment in one coherent and consistent approach. We have

closed the loop from strategy to execution, from proof to improvement, and turned it into a continuous loop.”

Find the sweet spot You explain to me that this was enabled by focusing on the core of the governance, risk & compliance process and finding the sweet spot. You have realized that you have to increase the meaning quotient of work (Cranston & Keller, January 2013). So you have become what Gary Hamel calls an “entrepreneur of meaning” (Hamel, February 2009).

Entrepreneur of meaning

Meaning is more than rules You have found that three simple words are crucial: meaning, decision and context. “Meaning,” you say, “is about the meaning of regulatory, policy and business requirements. It tells me ‘what’ I have to do ‘how,’ ‘why’ and ‘when’ in a specific situation. So, meaning is directly connected to the context of the situation at hand. Therefore ‘meaning’ is more than simple rules.” Decisions play a vital part in your end-to-end process from strategizing to execution and from monitoring to improving. You and your employees take decisions on a daily basis about aspects like a credit application, risk assessments, deal or no deal, based on the meaning of requirements in a specific context of a specific case.

Meaning drives your business operating system In your “future perfect,” you tell me, you have established an actionable framework in which the meaning of requirements is extracted in human and machine-readable form and stored as your source of truth. This source provides the fuel that drives your entire business operating system. It is directly infused into your operations and executes preventive controls to shield you from risks. It enables you to take automated decisions and provide decision support when and where needed. This shortens your cycle time and reduces the workload considerably. This source of truth enabled you to achieve the knowledge-based level of trust you enjoy from your regulatory authorities.

You are keen to emphasize that you are talking about a conditional source of truth. It is an intelligence source that tells you what is true within a certain context that is specified in regulatory and policy documents. This regulatory and policy intelligence source feeds the decision process based on preconditions, and always in line with the objectives you have

defined. The preconditions determine what kind of information is needed and which activities are allowed or required by whom at that moment in the process. Each new piece of information leads to an automatic assessment of what is now needed and allowed.

Eliminate traditional workflow

By handling decisions this way, you have eliminated the traditional vision of workflow and processes, including all their limitations. Instead of designing consolidated flows that are believed to address the constraints of all parties involved, you have captured the individual constraints of all stakeholders, and the business processes meeting these constraints are automatically inferred. The result is flexible business processes that allow experts to shape their own work based on their experience and seamlessly adapt to the dynamic network they are performed in. (Grondelle & Rensen, 2013)

The exception is the rule

Since all decisions are based on the meaning of requirements in the context of every case, you are able to treat every case as unique. There are no exceptions anymore, because you have made the exception the rule.

Become truly customer-centric

On this basis, you were able to establish an advanced degree of self-service functionality. It turned out to be the missing stepping stone for your organization to become truly customer-centric.

Compliant by design

Since your framework records the decision data with a trace to the requirements on which they are based, you can always prove that you are compliant. You are “compliant by design”. This enables real-time monitoring and instant and consolidated reporting. It removes the burden of e-discovery in litigation cases and frees up time to focus on assessments for continuous improvement.

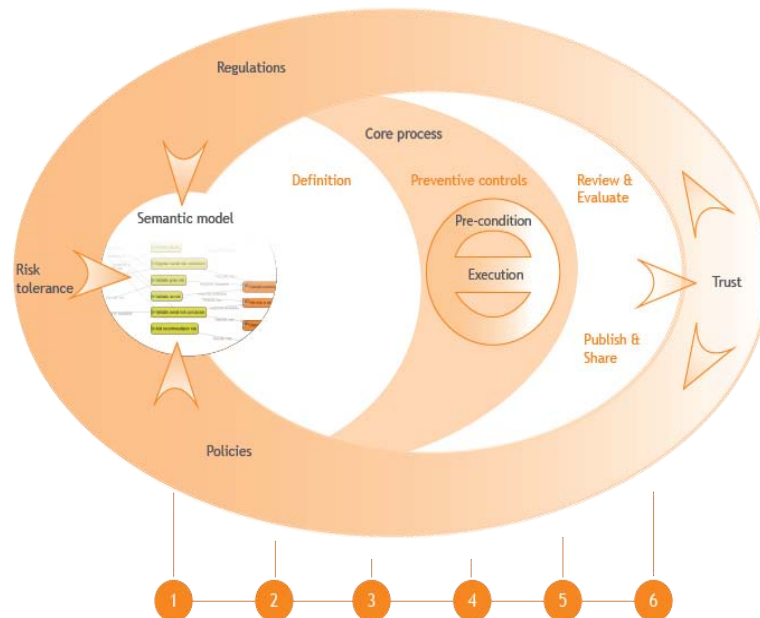
Actionable framework

Looking at my face, you see that is hard for me to understand what you mean, so you draw me an image of the framework that you envision in your “future perfect”.

The image shows the process of reacting to external regulations by distilling the requirements, executing impact assessments, creating implementation scenarios, defining or mapping the new requirements to your strategy and objectives, deciding on the acceptable risk tolerance and “translating” the result into policies, controls, reports and

performance metrics. You even mention alerts and training as elements that can be defined in your framework.

Figure 3: Your actionable governance, risk & compliance framework



Source: Be Informed, Thei Geurts, 2013

- 1 **Regulatory challenges**
Coping with regulatory challenges. Lifecycle management of regulations, objectives, risks, policies & controls. According to all standard and propriety frameworks (e.g. risk, legal, business, compliance), including 3rd party oversight.
- 2 **Semantic model**
Meaning based transposition of requirements, rights, obligations and constraints in a coherent and resilient model, enabling comprehensive & instant changes. Time-sensitive rules.
- 3 **Definition**
Executable output manifestations of the model based on one version of the truth. Supported by e.g. dynamic forms, wizards, checklists, workplace and services. Up to date documentation.
- 4 **Preventive controls**
Infusion of GRC-intelligence in the core process. Execution of prescriptive and preventive controls. Automated decisions. Dynamic activity plan and unified case view. Situation and role aware collaboration and actions, based on preconditions. Case records and audit trail.
- 5 **Review & Evaluate**
Dynamic activity plan for monitoring, auditing, reporting. Comprehensive overview with link to regulations and policies on which decisions are based. Data integration, merging, access and retrieval. Notifications, dashboards, instant and consolidated reporting from multiple perspectives. Feedback and continuous improvement.
- 6 **Publish & Share**
Publishing and providing access to data and reports. Enabling real time oversight for all stake holders. Proof of ethic behavior, enhancing public trust.

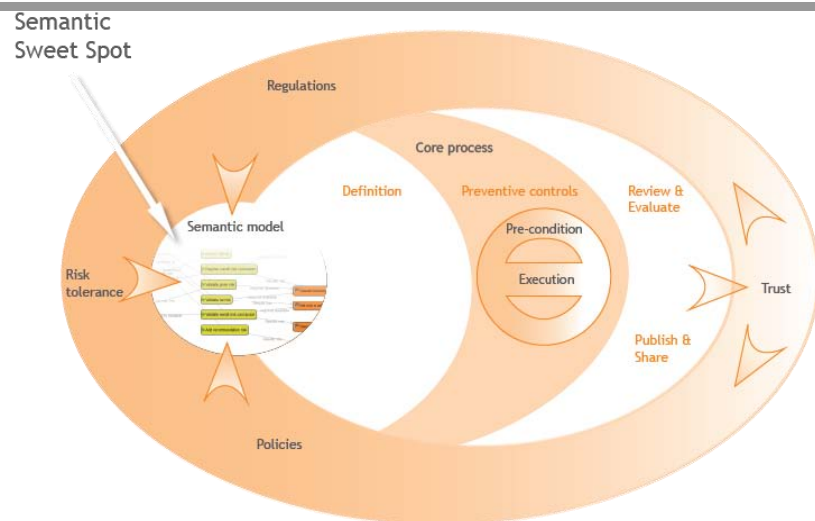
Then you draw my attention to what you call “the semantic sweet spot” of your framework.

The semantic sweet spot

Source of truth in a model

The semantic sweet spot contains your source of truth, in which all requirements are transposed into a man-and-machine-readable semantic model. “Semantic means meaning,” you explain to me. “It is not only our sweet spot, because it contains all the meaning, rules and conditions, but also because it has an embedded ability to ‘transform’ itself as a portal, a knowledge base, a wizard or as a service. It is directly executable in many forms. It is the catalyst of all our operations - the core differentiator that makes the ‘future perfect’ feasible,” you tell me.

Figure 4: Managing meaning



Source: Be Informed, Thei Geurts, 2013

Preventive executable compliance controls

Based on that sweet spot, you are able to infuse compliance rules into your process and execute preventive controls. You use automated decisions and decisions that are guided to a specialist based on the case and rules at hand. All your knowledge workers work together across their silos.

Dynamic activity plan

They are supported by a dynamic activity plan that helps them to plan and perform their job within the guidelines and boundaries of your risk policy and procedures. All activities and decisions are recorded and can be used for monitoring and reporting. You can publish reports, provide access to your knowledge base, as you mentioned before, and share data and findings across the enterprise.

Managing meaning

You tell me that this approach has changed the mindset of your organization. “We are now more focused on managing

meaning, improving our performance and exploiting the possibilities that regulations offer. We now regard a regulatory change more as a business opportunity than as a threat.”

Risk-aware culture Finally, you draw my attention to the behavioral aspect. “In the past, we had huge difficulties in terms of how to establish a risk-aware culture enterprise-wide,” you told me. “In my ‘future perfect,’ it is always clear to everyone what they have to do and why. Tolerances are embedded in the decision process, and preventive controls reduce the temptation and even the possibility to diverge from our principles and policies. This reduces the risk of fraud and other prohibited forms of conduct.”

Augmenting your GRC intelligence position

“If I try to grasp that picture of your ‘future perfect,’ it is evident to me that you have created a GRC intelligence position that offers extreme value. Since you have established a smart method of decision control, you must have eliminated all, or at least a large proportion of, your main cost drivers. You have probably also freed up capital because you can act reliably with lower risk thresholds. This means that you must have become more profitable.”

Become more profitable “That is absolutely the case,” is your answer. “We were, for example, able to move a large portion of our assets from tier 3 to tier 2 and from tier 2 to tier 1 and also cut our claim costs considerably. If accountancy or other intermediary organizations provide us with GRC as a service, we can simply infuse their regulatory intelligence into our process and become even more efficient. We have already thought about decision measurement and decision pricing as a new pricing mechanism.”

Sustainability “How about sustainability?”, I am tempted to ask. “How, for example, do you deal with regulatory change?” I can imagine that that question may make you smile. “Regulatory change is not an issue anymore,” you tell me. “We only have to change a regulatory requirement once and in one place to make it executable throughout the whole process. That is a consequence of establishing one version of the truth.

Regulatory change in one day “We can process a regulatory or policy change in a few days, and in hours, if needed, instead of months. Since we are able

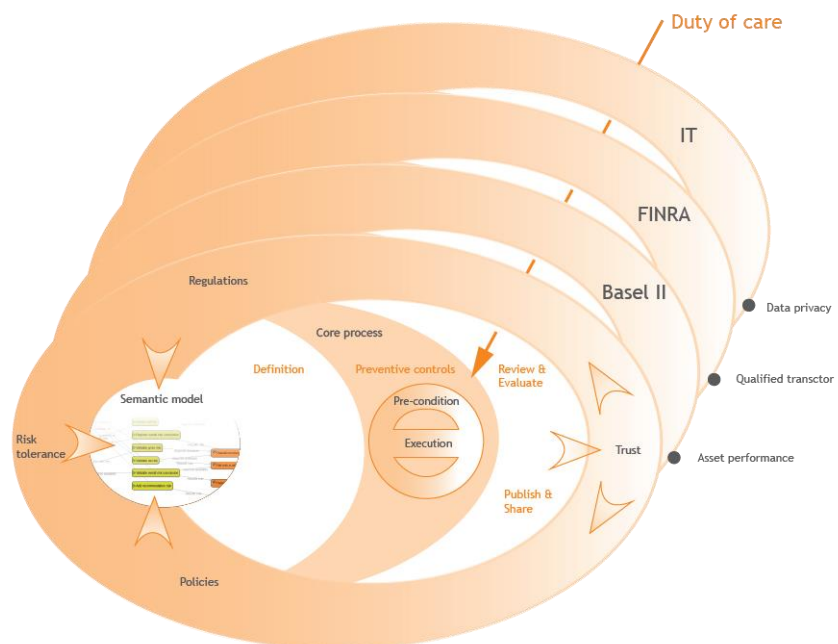
to apply regulatory and policy requirements to all products, we can detect upfront potential overlap and conflicting requirements. Last but not least,” you add, “the cost of change has decreased dramatically.”

Support multiple frameworks

You even draw my attention to the fact that your approach is able to support all legal frameworks, like Basel III and Dodd-Frank, and support all standard and propriety risk and control frameworks, not only in financial services, but also in other matters and domains, like safety, environment and health.

“So it doesn’t matter if new regulations will be issued; we can handle them,” you say. “We can provide the same level of trust to our regulatory agencies and apply the same approach enterprise-wide. We even use the same approach for managing our third-party contracts to cover our whole supply and demand chain.

Figure 5: Support for multiple frameworks



Source: Be Informed, Thei Geurts, 2013

Enterprise-wide risk management

“In essence, we have created a resilient system that is adaptive and agile at the same time, as well as highly actionable, collaborative and inherently transparent. It also provides all the dashboards we need, allowing the board and myself to execute our governance role and focus on the things that really matter for our business continuity. In addition, our

risk manager finally has realized his vision of an enterprise-wide risk management system for all risk types, and is thus well equipped to deal with uncertainties. As a result, my legal and compliance officers can focus more on their advisory tasks, and internal audit can audit in real time instead of retrospectively and recommend remediation. External auditors and supervisors receive a full service, which reduces the burden on my operations and makes expenses negotiable.”

Predictable IT “That’s quite impressive,” I reply. “How about your IT department? I noticed that you didn’t mention them.” “They are enthusiastic, too,” you respond. “Naturally, they were skeptical in the beginning and wanted proof. They are focused on remaining predictable, but also eager to support the business. Extracting meaning, context and decision-based elements from the code made this much easier for them. Now we have separate release cycles for regulatory, policy and IT-related changes.”

Engaged workforce My next question could be, “What about your employees below the management level? How did you facilitate their buy-in?” “That all relates to the trust-factor,” you answer. “We have managed to transform the vicious spiral into a virtuous spiral. Since we focus on the meaning, context and decisions, they have more autonomy to collaborate and decide within the constraints that are set for their role and competence level. The level of engagement is astonishing.

Figure 6: The virtuous spiral



Source: Be Informed, Thei Geurts, 2013

Collaboration “As I said, the whole process is supported by a workplace and a dynamic activity plan that guides the execution of mandatory and optional tasks across all divisions and departments. This applies to all activities, like policy-making, impact assessment, defining controls, executing controls, monitoring, reporting, auditing, recommending or remediating. It is a layer above the organization that connects all activities without affecting the systems and responsibilities that are already in place. It offers freedom and control at the same time. We have broken the vicious spiral and have transformed it into a virtuous spiral.”

Transformation Thinking about the impact of such a revolutionary approach, I wonder how you have transformed your organization to achieve that future position. Your answer would probably be, “How do you eat an elephant? Slice by slice. Once you have created your vision, the transformation starts. You have to follow an evolutionary approach to realize the business case of the whole process and the business cases of every part of it. Start with a solid foundation and expand from there in an incremental way. Lower your GRC burden in a controlled way that fits the maturity and capabilities of your organization.”

Doing it the organic way Looking for a metaphor, you say, “Do it in an organic way, as if your organization is a living body. Grow step by step, explore with an open mind, accept small pains to achieve big gains and foster your self-healing capability. In other words, if events hurt you despite all precautions, be prepared and able to remediate and continuously improve. Utilize instruments and technology that inherently strengthen your organic capabilities. Don’t try to model the whole world, but focus on the essential. The less optimal solution often delivers the best cost-benefit ratio. Never forget that managing meaning is essentially managing the heartbeat of your organization.” That is your advice.

What is holding you back?

Business technology I wonder what is preventing you from realizing that “future perfect,” and you tell me that it is the lack of an enabling technology. You are fully aware that “business as usual” is no longer possible, since continuous change and uncertainty prevail. However, you are still looking for a technology that is non-invasive, that supports your process end to end, and is dedicated to business-centricity.

Face the pace of change Knowledge and experience should, in your opinion, be separated from the fundamental infrastructure required for processing, because they change more rapidly. Knowledge, know-how, expertise, best practices... “Call them what you like,” you say, are, in your opinion, fundamentals that need to be managed via an actionable framework by the business itself.

Currently, though, you are still impaired by a situation in which your process execution knowledge is hidden in computer code or lives in isolation in user guides and spreadsheets. Data authenticity and integrity are hard to maintain, and you cannot stay up to date.

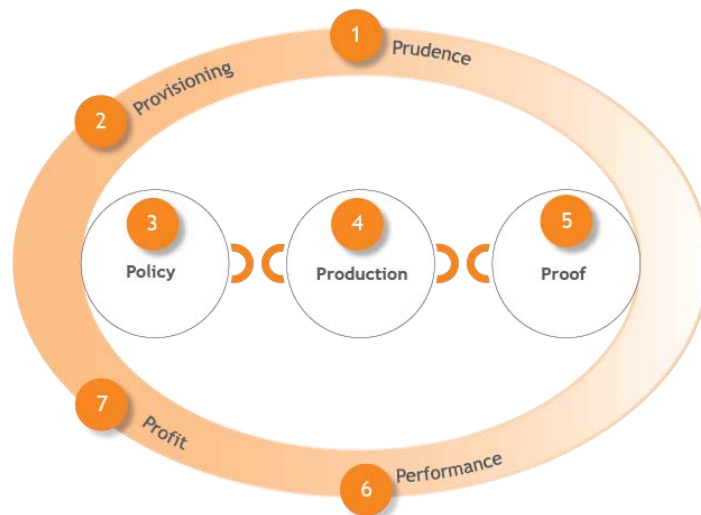
You even tell me that in New York, the home of some of the largest financial institutions in the world, there are some 14,000 proposed regulations that affect their global operations: rules that to a large extent are not (or cannot be) implemented across the financial enterprises. This is in full violation of not only U.S. regulations, but also global regulations such as Basel II & III and international regulations of the European Banking Authority.

Reporting You are facing a similar problem. Even worse, the number of regulations is increasing, as is the speed of changes. Reporting cannot be based on approximation anymore, but must be based on detail in order to survive serious scrutiny. Reporting also has to meet strict deadlines that are in conflict with the data provisioning cycles of your IT systems. Your present reporting is mainly based on time-consuming hindsight analysis, and you are unable to reduce your reporting latency. As a consequence, you are reporting too late to the regulatory authority, which leads to further undermining of the level of trust, which is already low.

Maintain risk-adjusted profitability Your board cannot fulfill its regulatory obligation for oversight. Not being compliant may result in high penalties and even prosecution, both for them and for you. You are struggling to maintain a risk-adjusted profitability. The cost of GRC implementation is high, and does not directly contribute to the primary business in terms of revenues and profit. Overall business performance is going down, which is why you want to tackle your compliance issues from a systemic perspective.

The 7P model You are showing me your 7P model, and explain to me that the essence of GRC can be expressed in seven concepts, starting with the letter P.

Figure 7: The 7P model of governance, risk & compliance



Source: Be Informed, Thei Geurts, 2013

“The two open connectors symbolize the current fragile transfer and connection points between the preceding and next concept,” you explain to me.

Then you create a list of the concerns that belong to every concept in the model. The list now offers a condensed - non-exhaustive - list of the concerns you are dealing with.

Figure 8: Your 7P model concerns

- 1 How to reinstall confidence?
Society and Government lack trust and keep issuing regulations to force the exercise of prudence and enforce transparency.
- 2 How to get help to cope with the flood of new regulations & expectations?
Provisioning services from external bodies and providers are fragmented and lack structural, syntactic and semantic interoperability. How to control cost?
- 3 How to address continuous regulatory pressure?
How to assess risk and impact of new regulations and changed conditions?
How to align business objectives & performance within the defined risk tolerance constraints?
How to manage strategic and operational risk, promote ethical behavior and prevent fraud and other misconduct?
How to develop, align, distribute, communicate and maintain directives, policies, procedures and controls and their lifecycle?
How to provide meaningful insight from multiple perspectives?
How to manage and impose contractual mandates?
- 4 How to implement risk profiles with procedures, preventive and repressive controls in the business? How to keep them up to date? How to plan controls?
- 4 How to align, execute and enforce controls across many products, systems and business lines? How to get a 360-degree view of the client case context?
How to make risk-tolerance-aware decisions based on preventive controls?
How to automate decisions?
How to monitor and synchronize collaboration? How to treat every case fair?
- 5 How to record, secure and access data? Transaction and interactions (arti)facts in many places, not linked to policy and controls.
- 5 How to monitor, control and assure compliance?
How to move from sample based backward to continuous forward control?
How to report in time from multiple perspectives, internal and external?
How to collaborate with different parties and roles?
How to provide liability and litigation proof from a dispersed landscape?
How to identify and detect internal risk?
How to mitigate risk?
- 6 How to prevent that the business operating system slows down and the business is underperforming?
How to prevent that working capital is not available due to high risk reserves?
How to concur technologic limitations and growing complexity?
How to apply technology to optimize gradually and assure return on investment?
- 7 How to remain profitable and seize opportunities? Business as usual is cancelled; new market risks appear overnight and come from everywhere.
How to cope with change dynamics?
How to create trust from the regulatory authorities and prevent reputation damage?

Source: Be Informed, Thei Geurts, 2013

Our conversation unsurprisingly ends with a sigh that you really are looking forward to the moment when you can relieve the GRC burden and finally engage in a transformational journey to your “future perfect”. You currently feel like a circus acrobat, balancing on a rope above the Grand Canyon without a safety harness or net. Your main concern is not falling down, instead of going forward and enchanting the public with your capabilities. For this reason, in the subsequent chapters we will discuss with John Coyne what is required to make the “future perfect” of our conversation partner come true.

Part II:

How to enhance regulatory capabilities and oversight

Introduction

My second conversation partner is John Coyne. John directs worldwide financial markets and business innovations. He is a leading technologist, software executive, inventor, industry analyst, and developer of transformative business innovations. John is a published inventor with multiple patents issued and pending in advanced technology, devices, systems, and methods in high technology, financial services, media and defense industries. He has developed innovations that have transformed assets and business performance. John led the Financial Services Genome project that articulated the first comprehensive model of modern financial services.

I knew that John had some interesting literature on real-time regulatory oversight, regulatory management and governance as a service, but not published it. This led me to contact him and agree to co-author this book.

Deep-dive dialogue

We agreed to use the vision paper of the “future perfect” as a starting point. Based on this admittedly generic vision, John offered to go into more detail about aspects that are largely underexposed in the “standard” GRC literature - aspects we judged to be relevant for a deeper and broader understanding. We agreed that we would hold a series of interviews to elaborate the most important aspects. We also agreed that we would maintain the dialogue style from the vision paper for the chapters to come.

John proposed that we start with some non-IT-related aspects, since he expected that not every reader would be interested in the IT angle. So we decided to start with aspects related to regulatory oversight and regulatory capability.

First impressions I met John for the first interview in Palm Beach during the spring break. It was one of those rare days on which rain and clouds obscured the Florida sky. It was the perfect weather for an in-depth interview.

“Hi, John. Thank you for taking the time to share your opinions with us. Before we dive into the aspect of regulatory oversight, may I ask you which three aspects of the ‘future perfect’ vision appealed most to you?”

The only real line of defense John smiled mildly and said, “Thank you for asking me, Thei. I must say that it was a pleasure reading that vision paper. The first aspect I would like to mention here is the concept of a GRC framework of frameworks. That is highly relevant, since heavily regulated industries are almost always subject to multiple frameworks and regulatory regimes. By the way, it is also highly relevant that your GRC framework is based on semantic technology. The second aspect is the notion of actionable controls; in my opinion, controls that are executed in operations before a decision has been taken are the only real line of defense. The third aspect I very much like is the systemic view. Many of the problems regulated industries are struggling with are based on solving ad hoc problems with ad hoc solutions in an isolated way. Only if you take a systemic view, will you discover the sweet spots that really make the difference.”

As the rain began to pour even harder, we moved on to the subject of regulatory overload.

Regulations are growing faster than most GDPs

First of all, I asked John whether he could give some details on the volume of compliance regulations and their impact. This turned out to be an easy assist, and John immediately provided some details.

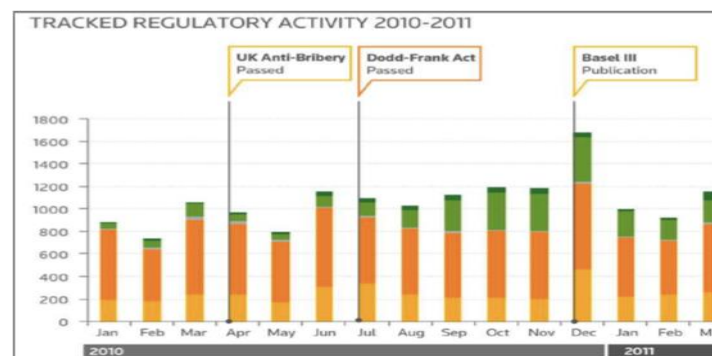
A growing regulated world “Today, the regulatory environment is growing faster than the economy,” he said. “New rules are affecting regulated industries and businesses soon to be regulated. The rate of increase in regulatory compliance rules exceeds the capability of businesses to integrate them into their environment, leaving them and their management vulnerable to fines, censure or worse. Examples include JP Morgan, Goldman Sachs, Barclays and HSBC, all of which have been subject to

finances, hearings, loss of reputation, loss of faith and, as fallout, loss of market capitalization affecting all of their stakeholders.”

Regulatory tsunami

John mentioned, like my previous conversation partner, that worldwide the trend has led to over 14,000 new proposed and enacted rules in regulated industries. There are 60 new announcements per day on regulatory change. John presented me a chart. The chart shows the trend from 2010 to 2011.

Figure 9: 14,000 proposed and newly enacted rules



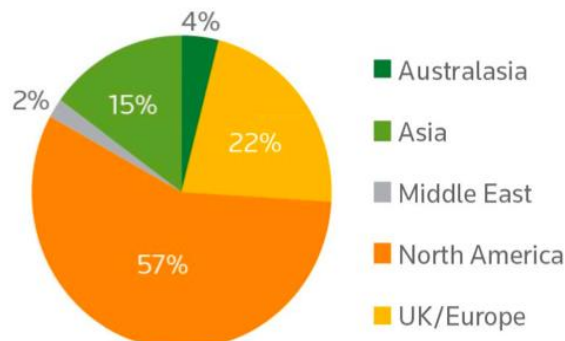
Source: Thomson Reuters, 2012

The U.S. leads the trend

It is obvious that the U.S. leads the trends, but as the next chart demonstrates, Europe and Asia are also following the path of increased regulation.

Figure 10: Increased regulation per region

ACTIVITY BY REGION (over a 24 calendar-month period)



Source: Thomson Reuters, 2012

John repeated that regulations are growing faster than most GDPs. He said, “In fact, in a world of economic decline, it is the fastest-growing industry.”

Unable to grasp the interdependencies

“Businesses are no longer able to grasp the interdependencies between regulations and their relation to the internal policies. Especially for international businesses and those that transact business internationally, there are competing local jurisdictions that may trump, conflict with, or otherwise create turmoil with regulations that are in conflict with each other. They wonder how to deal with this complexity.”

Regulated industries need a solid regulatory capability

John looked at me and concluded, “So you may now understand that organizations in heavily regulated industries definitely need strong and solid regulatory capability in order to cope with the challenge of regulatory overload.”

Regulatory capability

At my request, he defined the concept of regulatory capability as follows: “Regulatory capability in a broader sense can be defined as ‘all competences and activities of the regulated company which are affected directly or indirectly by regulation’. They cover the motivation, definition, operation and evaluation dimension. They range from tracking and analyzing the impact of legislation, and designing and developing policies and procedures through implementation, operationalization, assessment and improvement activities.”

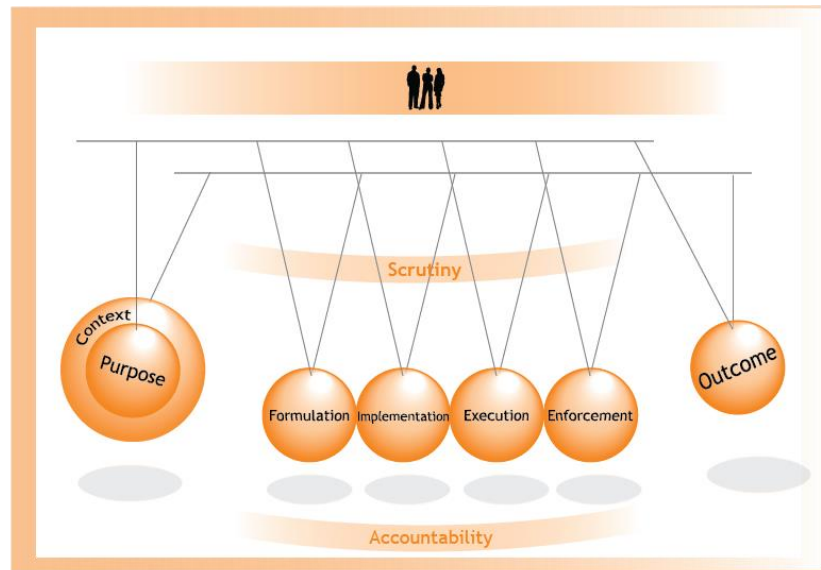
Policy life cycle

“In the governance, risk & compliance domain, some use the concept of ‘policy life-cycle management’ to make a distinction between government responsibility for regulatory life-cycle management (making and maintaining regulations) and enterprise responsibility (making and maintaining policies for applying regulations). However, you should be aware that the policy life cycle, if too narrowly defined, is only a part of the whole regulatory life cycle, and therefore of the GRC life cycle.”

Maintaining the policy momentum

This remark reminded me of Newton’s cradle image, representing the policy-making system in the public sector (Geurts, 2011). It has four stages that are also applicable in the GRC space. Even the same processes of scrutiny and accountability aspects are applicable.

Figure 11: Putting purpose into practice



Source: Geurts, T. Public Policy-Making - The 21st-Century Perspective, 2011

In Newton's cradle, almost all the energy from the first ball is passed through the chain to the last ball. If the system is not in sync, because some balls deviate, the system becomes chaotic and the energy evaporates. This effect is almost inevitable if collision between multiple systems is not detected in advance and taken care of. The challenge is to maintain policy momentum in the process of putting purpose into practice. That is not possible without policy life-cycle management.

Goes beyond policy management

"Regardless of what you call it," John said, "you should therefore be aware that a regulatory capability is needed for managing the whole life cycle. It is about more than implementing regulatory change or translating regulations into controls. It goes beyond policy management, because normally management starts after you have defined your goals and objectives. The policy phase is preceded by a strategic phase in which the business motivation is defined."

Intertwined business motivation, operation and evaluation

"Business motivation, operation and evaluation are becoming more and more intertwined. This is especially the case if they operate in a complex and dynamic environment where they may be subject to many volatile regulations. Regulations can impact strategy, goals and objectives, and necessitate revisions. And by the way," John added, "the same applies to the results of assessments, whether they are carried out ex-

ante (before implementation), ad hoc (during operations) or ex-post (after the outcome). John Boyd's OODA loop is fully applicable (OODA-Loop)."

Cost of maintenance "Then maintenance must be an issue and concern in the sector?", I observed. "Oh, yes," John responded. "Maintenance and life-cycle management are of the utmost importance. The costs are gigantic and often not even fully known due to organizational, budget and administrative fragmentation."

John had put his message across clearly. I now understood why he wanted to address regulatory aspects related to governance, risk & compliance. There was much more to the domain than a bystander might assume at first glance. Having solid regulatory capability, and thus being able to perform and adapt, was clearly a necessity for long-term survival.

Can you take care of my portion of the regulations? We ended the first interview session and went for a lunch. The food was excellent. Not being used to American-sized portions, I was unable to finish. The waiter asked me whether I would like to take the leftovers home in a bag. I declined, but wondered whether there was some kind of parallel with regulations. What if it were possible to give you portion of regulations to a third party and consume them tailor-made according to your needs and appetite? I decided to discuss this with John, but it slipped my mind.

Real-time regulatory oversight

It was still raining, but the warm rain didn't bother us. After a short refreshing walk, we resumed the interview. John proposed that we would discuss real-time regulatory oversight, since this was an important part of an organization's regulatory capability. "Very well," I said. "Could you please define this term and illustrate what it means?"

Mapping transactional events to regulations and policies "Real-time regulatory oversight maps transactional events to the external regulatory compliance rules and the internal policy decisions with a full reasoning chain to back up the decision recommendations or obligations," was John's definition.

I looked at John and asked, “What do you mean exactly? Is it a kind of certificate of compliant behavior that documents what I have done and the reasons why?”

Guiding decision-making

“Amongst other things,” John reacted. “But even more importantly, real-time regulatory oversight provides the signposts and best practices that guide the decision-making process, not only alerting the user, but advising and guiding the direction of activities, with full reasoning as to why the recommendations are being made and - in some situations - helping to escalate the decision process within and across decision boundaries.

“For instance, an ambiguous regulation impacting a transaction can be referred to the legal policy-maker for interpretation and authorization. A risk policy-maker can then further corroborate the interpretation of the rule and how it applies to the internal policy of the business. This increases the fluidity of the business, as opposed to trapping it in a framework of restrictive rules.”

Restriction is not the only cure

Since John had now also mentioned restrictive rules, I wondered whether he was referring to the executable preventive controls that my previous conversation partner mentioned.

John reacted with a clear statement: “There is a place for both restrictive and prescriptive controls. The fallacy is the belief that direct intervention with restriction is the only cure.”

Imagine a world where you had no choice

“Imagine a world where you had no choice, where you were not allowed to reason about your decisions. Preventative, restrictive controls on every aspect of decision-making would make life impossible. Of course, there are specific situations where prevention is better than cure: passwords, permissions, restricted access, need-to-know and many others. But in general, even with these preventative controls in place, you can reason about their necessity and understand their usefulness. In other situations, like restricting your speed while driving in a school zone, you use your reasoning, as the car does not automatically brake. You understand the need and usefulness of such a restriction, and the prescription used to guide you is a sign that says ‘reduce your speed’. You make the decision, but the consequences of non-compliance can be unpleasant.”

Coping with ambiguity	<p>“For prescriptive rules, such as field descriptions, temporal functions, permissions, etc., this can be facilitated by a straight-through process using traditional restrictive controls. However, for decisions of an ambiguous nature, where multiple decision factors may exist, we need to surface the decision requirement, the parties involved and, of course, find the map to both the internal and external policy regulations governing the decision. In this way, management sign off, on, or add a comment to a particular set of reasoning that the system provides.”</p>
Controls in traditional systems can become an obstructive nuisance to operations	<p>John explained to me that restrictive and preventative controls impact the business at the transactional level. In traditional system implementations, they can become an obstructive nuisance to the operations of the business and, furthermore, be overwhelmed by the sheer number of variables in the control process. “This is, in part, due to the ambiguity of many of the regulations and the conflicts across business boundaries,” he said.</p>
Looking at the systemic view of the topic	<p>“And prescriptive controls? What about them?”, I responded. John replied, “Prescriptive controls take the entire topic into consideration, and if mapped correctly, provide both a detailed and broad look at the issue being dealt with, within and across multiple roles, relationships, responsibilities and boundary conditions. But even more importantly, they allow us to look at the ‘systemic view’ of the topic. This means viewing the impact of the regulatory issue across multiple frameworks important to all of the constituents of the decision process: users, managers, departments, divisions, the enterprise and its customers, and regulators.</p>
At the end of the day, the business needs to make the decision	<p>“Secondly, restrictive controls may prevent otherwise ‘reasonable’ decision-making processes that need to be carried out by management from taking place, especially where ambiguity and cross-discipline frameworks are impacted. In other words, at the end of the day, the business needs to make the decision, not an automated braking system.”</p> <p>“Okay,” I said. “Let me try to summarize this in my own words: real-time regulatory oversight is, on the one hand, about actively supporting the actual decision-making process by guiding, imposing and enforcing the correct usage of a rule or method based on the chosen or imposed constraints. On the</p>

other hand, it is also about recording the decisions made and the rules they are based on. Is that correct?" John smiled and simply answered, "Yes."

**Descriptive, restrictive
and prescriptive
approaches**

"Furthermore, there seem to me to be three ways of handling controls," I continued. John looked somewhat surprised at that remark, so I proceeded. "The traditional way is the descriptive and procedural approach, in which control rules are documented in a manual and employees need to be trained to use these controls manually. The second approach is the restrictive way, which is dominated by repression and prevention. Controls are either automatically executed or enforced. The third approach is the prescriptive way, more like a doctor's script, in which employees are actively guided towards taking certain steps, but with more freedom to operate within the set constraints."

Full reasoning map

John agreed, although he felt obliged to repeat that, by reasoning through a decision, you can, when making the decision, record the rules that you applied, where they map to regulatory rules, and the related internal policy. He continued: "When audited, the entire reasoning and decision map is built into the transaction, so that regulators, lawyers and policy-makers can see exactly how the decision was made: agreement or disagreement, refinement or elimination of rules. The impact helps both the regulator and the regulated."

Spontaneous networks in the decision process

**What about
collaboration?**

It seemed to me that, especially in the prescriptive situations, the dynamic of actors and tasks could be enormous. Consequently, I assumed that some form of support must be needed. I wondered what John's thoughts were on collaboration in a dynamic environment.

**The process-flow
anathema**

John smiled like he was being asked something he had explained before to someone else and was eager to also explain to me. "Supporting collaboration in a dynamic environment is about supporting spontaneity," he said. "And, as you know, spontaneity is anathema to business process flows because it requires the ability to be fully adaptive to a situation, especially the unforeseen. When reasoning engines are used that separate business requirements from processing

flows, spontaneity can be accommodated. This is especially important in order to accommodate change and complexity.”

Accommodating spontaneity in business - that was an interesting concept. I asked for some further clarification, which John provided with great enthusiasm.

Dynamic spontaneous collaboration

“The same mechanisms that facilitate real-time regulatory oversight also provide the ability to create spontaneous collaborative networks. Consider the GRC framework that you presented. The semantic sweet spot and decision base in the framework can identify not only the decisions required, but also who or what needs to participate in the decision and when. These ‘spontaneous’ collaborations are both dynamic and non-linear. They may also incorporate hybrids of human and automated participants. It is the non-linear dynamic ability of the architecture you sketched that creates the real power to adapt and transform. This is possible because the process flow is separate from the process requirements. The process requirements set the goals of the compliance system, map them to the controls, and then surface them to the appropriate participants.”

John was right. When considering his words, it became clear to me that if you can master meaning and context in taking decisions, you can also support spontaneity between all of the involved participants.

Benefits for participants in the oversight system

“Okay, John,” I said. “I think I understand you. Let’s talk now about the participants. How would you classify them, and how do they benefit from the oversight system?” John took a short pause to think and then proceeded with a long monologue.

Operatives have a one-to-one link with the objectives

“In regulated industries, at the lowest level in the food chain, operatives will be entering into some kind of transactional framework, whether they are working with a client or producing a vital report. Real-time regulatory oversight establishes a one-to-one link with their objectives, provides best practices, and links all the regulated activities to the internal and external oversight controls.

Full audit trail

“Easy decisions are facilitated by the system and provide a clearly reasoned audit of all the activities; some

automatically. This can mean monitoring not only the transactions, but also the systems they used, the data, the networks and other background compliance functions. Where the role, responsibility and relationships are monitored, the oversight system provides feedback. When ambiguity is found, or when further decisions are needed, they are escalated to management across the corporate boundaries. This improves control and performance.

Parallel actions become possible

“Furthermore, while one action is being performed and awaiting control decisions, other actions by the user may be performed without interruption. The system can dynamically inform the user of which activities can be performed next, which are to come, and which are awaiting decisions. This improves workflow performance by an order of magnitude.

Management can review the reasoning behind decisions

“Management can review decision requirements, make recommendations and override decisions made by subordinates. The oversight system provides the reasoning behind making good decisions, highlights ambiguity, and allows for comments and documentation to be included. And this is especially important. Many decisions incorporate dynamic artifacts: e-mails, forms, spreadsheets and the like. Any decision based on these needs to be included and the real-time regulatory oversight capability allows them to be incorporated at the time and place of the decision.

Opportunity for business advantages

“For the C suite, the implications of compliance and regulatory controls impact the operations of the business. Being confident of compliant behavior is one thing; using it as a technical advantage is another.”

At that moment, I raised my hand and said, “Just a moment. Could you please give an example of the use of such an advantage?”

Cash-flow benefits from moving products to other baskets

John nodded. “For instance, liquid coverage ratios affect free cash flow, the lifeblood of a business. If a compliance system can monitor assets, they should be classified and categorized with the confidence that they meet regulatory rules regarding their true underlying value. Assets that are deemed risky that are moved to a less risky category can then provide a lower coverage ratio requirement, thus providing the company with more free cash flow for investment.

Typically, risks are divided into baskets: tier 1 containing the most favorable assets, tier 2 the less-well-understood assets,

and tier 3 containing the highest-risk assets, deemed as such because of the unknown variables that affect their value. Moving a product or a category of products from one to another can effectively transform available cash flow, balance-sheet performance and business fluidity. Access to changing rules and rapid adaptability to those rules is the key to rapid business adaptation.

Acting with confidence “Moreover, management can now perform their activities with confidence and, when decisions are made, access the reasoning behind them, how they comply with regulatory recommendations, or overrule them. This means that every transaction carries with it the reasoning behind it: from the lowest-level employee to the decisions of the CEO.”

“And how about regulators?”, I asked. “What are their benefits? After all, they are part of the environment as well.”

Monitoring national systemic risk John responded. “Regulators can now access data that allows them to monitor national systemic risk. If the top-ten regulated businesses in any sovereign territory can provide near-real-time access to financial risk data, a government can anticipate its general sovereign risk and make currency adjustments or recommendations.

Feedback for regulators “Regulators can actually receive responsive feedback on those regulations that are working successfully, and also on those that require clarification due to ambiguity. From the input of the regulated business, they can also determine their interpretations of the ambiguous rules. The response can improve overall performance of both parties.

Monitoring topical regulations across frameworks “This transformation turns regulation patterns away from control rules to advice and consent, based on reasoning chains. The automated capability allows topical regulations to be monitored across frameworks otherwise invisible to the regulators, or the business, for that matter.

Take “duty of care” “Take, for example, the topic of ‘duty of care’. A sound GRC framework is able to deal with models of activity at the topical level. A topic may be ‘duty of care’. Duty of care can be defined according to the context. In IT, there may be a duty to provide the necessary level of data privacy with rules for permissions, transport network distribution, journaling and other IT-based requirements. In the sale of a product, it may be that the seller has made full disclosure of the necessary

materials in order for the buyer to make a decision; for the risk officer, it may be to assure that risk levels are not adversely affected by the transaction.

Different frames of reference

“In the above, one can see that the same topic, duty of care, is dealt with in different ways by each participant, and each has a different frame of reference. In the architecture that I advise, each frame is orthogonal in its design and implications. In this way, the duty of care is dealt with in context. But the rules and regulations are mapped all the way through the topic.”

John ended with a closing remark: “And herein lies the difference between dealing with a complicated and complex system.”

This was a perfect moment for ending the first day’s interview session. From experience, we both knew that discussions about complex and complicated systems can take a long time. So we decided to continue the next day and start with this theme.

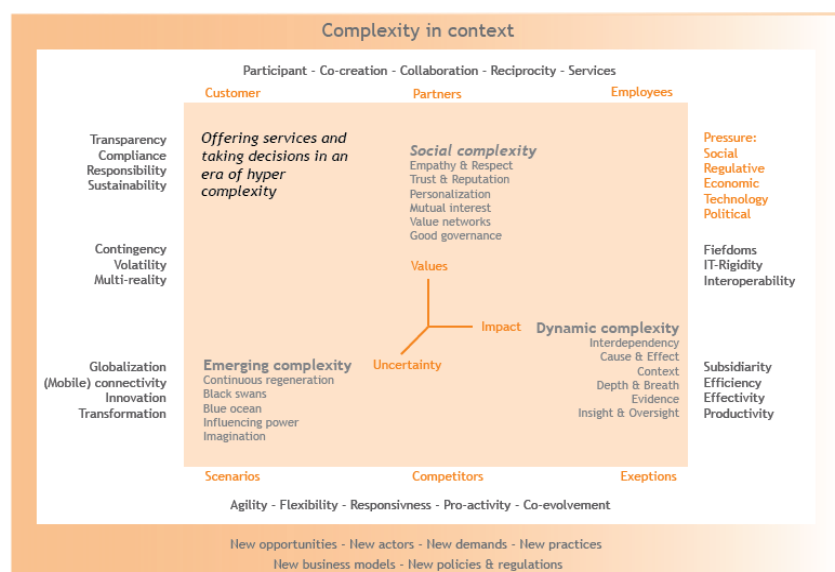
Combining spontaneity with personalization

Since John had some family business to attend to, I went into town looking for a restaurant to have dinner at. There was a slight drizzle, but that didn’t bother me. I found an Italian restaurant, which was very busy. This is usually a good sign, so I asked for a table for one. The receptionist showed me to one of the few free tables. Soon a waiter came to my table. He introduced himself as Vincente and told me that he would be my personal waiter for the dinner. That was a good start; you seldom find this approach in Europe. Unfortunately, however, there would be long intervals between Vincente’s visits to my table. For example, when I had finished a course, some twenty of his colleagues passed by my table without paying notice to me, which was rather annoying. It felt like they weren’t interested. As I sat there, I would have liked that parallel approach which John mentioned. I thought to myself that in customer services a combination of spontaneity and personalization would be a better approach to the duty of care.

Moving from the complex to the merely complicated

Complexity in context The next morning, after a good night's sleep, I looked up an image I created in 2011 about complexity to give me a starting point for our discussion. The image presents in the middle the three axes of complexity (as introduced by Scharmer) and groups of keywords that define the environment of hyper complexity in which decisions have to be made.

Figure 12: Complexity in context



Source: Be Informed, Thei Geurts, 2011

I met John at the breakfast table of the hotel. During the night, the rain had stopped, but it was still very cloudy. The weather forecast for the coastal zone was that it would stay this way all day, so it was another perfect day for work. We first looked back at the topic of the day before, about regulatory capability, real-time regulatory oversight and spontaneous networks.

Impact assessment Real-time regulatory oversight in the way John described it yesterday focuses entirely on the transactional level. So I proposed that we should today discuss not only the aspect of complexity, but also the aspect of impact assessment. After all, impact assessment is another important part of the regulatory capability of an organization. Besides that, it is

directly connected to the “realm” of complexity. It is affected by all the three axes and keywords in the “complexity in context” image that I briefly discussed with John.

To prevent a theoretical discussion about complexity, we agreed to focus on aspects related to risk-tolerance exposure and the modeling of processes and decisions within and between frameworks.

Old-school swim lanes Taking this angle as a starting point, John responded: “I have a friend who says, ‘It’s not what you don’t know that will hurt you, it’s what you know that isn’t so.’ The difference between dealing with complexity and complication is one of the unknowable versus the knowable. Typically, in old-school systems development, modeling comprises linear processes of formal reductionism to model individual elements or components of data and process flows with the typical decision-junction-switching directions or bridging of ‘swim lanes’.

The “yeah, but” effect “As anyone familiar with the process knows, this kind of modeling can get very complicated very quickly; especially, when one encounters after months of discovery the ‘yeah, but’ anomaly to the equation that has been set up. Part of this has to do with the inherent non-linearity of actual operations in the real world. Our attempts at orderly discovery of workflows were easy in the days of predictable outcomes in simple models of behavior that would encounter simple modifications when simple changes took place. These models usually operated in a single framework or context of activity: the factory floor, the accounts department, the typing pool.

BPMN deals with the knowable “The keyword, of course, is ‘simple’. But advances in technology, increased transaction speeds, multi-dimensional interests and web-scale interactions have made single-framework models and the concept of business process modeling notation (BPMN) tools not only redundant, but inappropriate for dealing with complexity. BPMN deals with reductionism and the knowable, and is therefore perfectly suited to defining complicated processes; in other words, the knowable. But it starts with the premise that something is knowable.

What if something is unknowable? “The hubris with which systems are addressed today states that ‘If I can know the state between A and B, and then B to C

and C to D, then, I can trace A to ...n functions, map them and the system can be knowable, definable and hence controllable.’ And, usually, these deal with single frameworks or contexts of operations. However, like life, business throws the occasional curve. And that curve usually comes from a framework not previously considered.

Unknown risks or what you know that isn’t so cause the most damage

“These curveballs are, for most businesses, equated to the unknowable, while the unknowable equates to risk. The appetite for risk is usually a factor of ‘known risk,’ but it is the unknown risks or ‘what you know that isn’t so’ that cause the most damage, as can be seen from the systemic collapse in the financial institutions that have caused an avalanche of unintended consequences resulting not just in financial problems, but social upheaval, personal catastrophe, and even sovereign collapse.”

Detecting the unknown

Separating the know and the flow

I recognized the linear approach trap that John mentioned and raised the question of which approach helps to detect the unknown risk and “what you know that isn’t so”.

John responded: “After forty or so years of continuous research and development in systems design and programming tools in the artificial intelligence arena, a level of maturity has evolved that facilitates the development of systems that deal with complexity. As a result, there are more complex (unknowable) than simply complicated systems. One outcome has been the separation of the relationship between objects and concepts and the flow of activity between and across them.

No “if, then, else” statement required

“The concept is simple: The mortgage (an object) requires (a relationship) top credit (another object or concept); there is no ‘if, then, else’ statement required. The process of determining whether the goal of obtaining a mortgage is to be met is dropped into an inference engine that determines the goal and the requirements for its achievement. It discovers the dynamic activities that go into achieving the goal should the ‘top credit’ requirement be met, or stops the activities should the goal not be met.

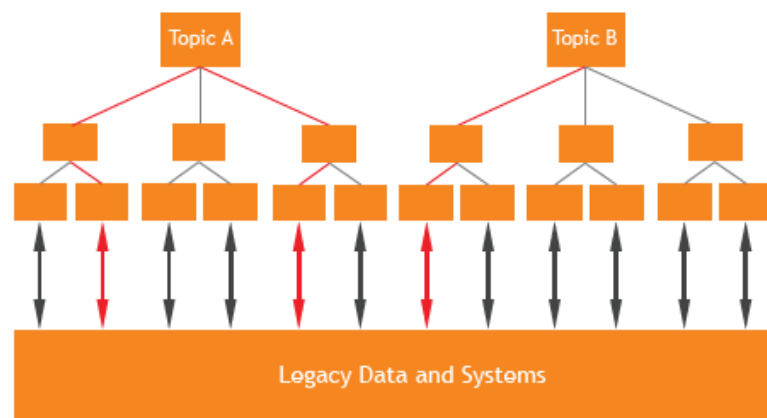
A simple transaction becomes a complex web of inter-framework activity

“That was simple enough, but it works in the context of the seller and buyer. Now add in the complexity of, say, regulatory controls and minority rights, and the computer systems to support the production of the paperwork. Then add the various underwriting and risk models to be addressed and the mitigation of the risk by breaking the product (the mortgage) up into interest-rate derivatives, and cross-border jurisdictions, etc., etc. In this way, a simple transaction becomes a complex web of inter-framework activity. And if you don’t believe that, try ascertaining who actually owns your mortgage.”

Try something different

Before I could comment, John continued unperturbed. “‘Okay,’ you say. ‘I understand the world is more complicated and that change is happening at an exponential rate. But what can I do?’ Well, you can start by trying something different for a change. You already know that what you are doing does not work, so why repeat the same mistakes over and over again?”

Figure 13: Satisfying topic-based requirements



Source: Be Informed, John Coyne, 2013

Modeling topics

“Looking at governance, risk & compliance and using the idea of simple concept (object)/relationship/concept model, we can begin with modeling topics of governance (risk, risk appetite, policies) and external regulations (compliance). Initially, we can start with topics at a high level. Duty of care (Topic A) is a topic that we will focus on for the time being. Topic B could be policy and risk tolerance.”

John drew the above picture and explained: “In the picture, the topics are modeled and contain process requirements and data that are needed to satisfy certain arbitrary requirements of the regulatory and policy topics.”

Assuring that the right job is done

“The regulatory and policy models are designed at a gross level. A first pass at interfacing to the sub-systems and data in the legacy environment is achieved through a service-oriented-architecture (SOA) approach. This is a non-invasive and non-destructive method of creating new systems without disturbing day-to-day business. These legacy systems may include point solutions for anti-money laundering, suspicious activity reporting or liquid coverage ratio requirements. The point of the model is not to replace them, but to assure that they are doing the correct systemic job.

Exposing risks

“Exposure to risks will be uncovered very quickly. In this case, topic A has two factors that do not satisfy the goal of the regulation. These become knowable, definable and fixable (at whatever layer of detail). Topic B has one missing variable. But the chain reaction moves the non-compliant nature of the problem up to the topic. Now you know that you cannot fully satisfy the ‘duty of care’ topic (A) and cannot fully satisfy your internal policy.

Now you know what you have to do

“Not satisfying a regulatory requirement with all its ramifications (fines, imprisonment, loss of public trust) may be more important than, say, not meeting only one trace line in your governance policy. Alternatively, they may be related (more on this later). But now you know what you have to do. As the model increases in complexity, it will expose more gaps, but as these gaps emerge, they will, of course, become knowable and therefore fixable.”

Dependencies within multiple frameworks

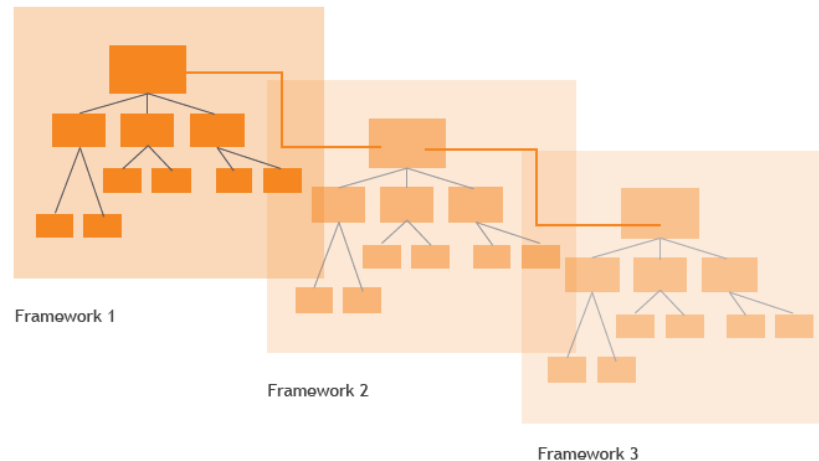
But it is getting more complex

John’s explanation made sense. The question, of course, was whether this same approach would be viable for dealing with multiple frameworks.

John replied: “That is a legitimate question. Whilst this is a powerful start, it is indeed only dealing with that single framework we discussed before. Now we will start to deal with multiple frameworks.”

John drew an image with three frameworks and continued with his argumentation.

Figure 14: Dealing with multiple frameworks



Source: Be Informed, John Coyne, 2013

“Now we are dealing with just three frameworks. The first is, for instance, a buyer/seller relationship in the business front end. The second is the internal policy related to, say, the product being sold, while the third is the operations and technology to support the business.

Discovering relatedness and interdependency

“Each framework has been modeled, and the behavior of each is well known. The name of the topic is, for instance, standardized in a business, data and/or process ontology; in our case, topic A, duty of care. Since we are not running a process, but just the relationships between (things), we can run our models against our inference engine and discover that there is a linkage between all three frameworks.”

Interrelated duties of care

At my request, John gave the following example. “In framework one, the duty of care may have been to apprise the buyer of all the risks related to the product being sold and mapped to a regulation dealing with consumer protection (which is fully discoverable in the model’s knowledge base). The second framework may concern stakeholder protection. In this case, the policy decision may be a risk tolerance or risk exposure relationship. ‘This is a \$30 million mortgage, and it has put us over the risk coverage limit we set for the month.’ This is mapped to an internal policy, and also mapped to regulations regarding the permissible acceptance or denial criteria. The third framework is the operations and technology

framework, and the duty of care here may be the protection and privacy of the data used in the decisions, its transmittal and traversal across and between networks.

“We can now determine something we did not know in the past, and may never have known until it was too late. That is to say that there is both an interrelatedness and interdependency between frameworks that is essential to both external and internal compliance. A case in point will demonstrate the importance.”

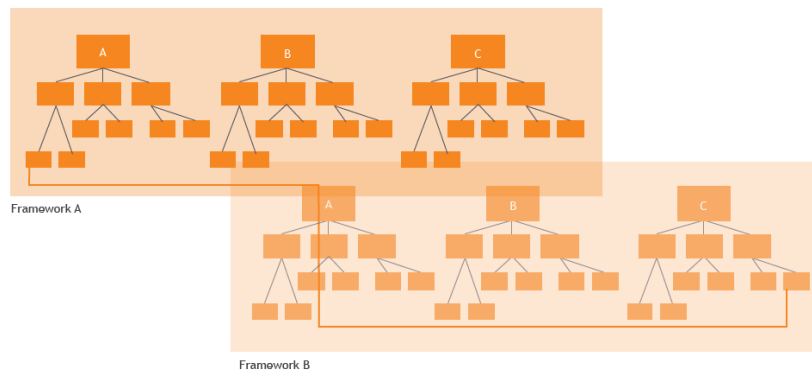
Cost of the unknown John provided yet another example of a real-life case. “A few years ago, a foreign national came to the U.S. and opened a trading account with a securities company at a retail location. He met the criteria to open the account, paid in his money, set up a relationship with the broker, and made some trades. He later went back to his native country and, after some time, asked the broker to send him updates on the trades he was making and his current positions. (This was obviously pre-internet.) The broker had the IT department produce and send the report. The broker and his company were summarily sued over transgressing data privacy rules in the buyer’s native country (where, incidentally, the brokers also operated). The ensuing litigation ended with a settlement amounting to tens of millions of dollars.

Rules may differ “Today, IT departments, and records managers in particular, are very sensitive to the distribution of client records across international borders, where retention rules may differ, and where certain data is not permitted to traverse certain networks that traverse certain geographic boundaries. You can now begin to see why systems integrators have such a hard time finding the connectivity or integration points in and between differing frameworks.

Surfacing something truly unknown “As complex as this model is (and I know it looks simple, but try doing this the old fashioned way), it is nothing when compared to unknown and multiple cross-topic dependencies. You can begin to get an idea of the complexity (unknowability) situation from the next diagram.”

John drew an image of two frameworks with a relationship at a lower conceptual level.

Figure 15: Surfacing the unknown



Source: Be Informed, John Coyne, 2013

“In this example, the model was run through the inference mechanism and now something truly unknown has been surfaced. It turns out that there is a relationship, and perhaps a dependency, between a leaf node of topic A and an obscure leaf connection to topic C (it doesn’t matter what that is). This dependency or risk factor may be problematic or irrelevant to the big picture. Nevertheless, the policy-maker (framework 2) is now actually able to make that determination, because they know something new that they did not know before. It may be an anomaly and an obscure link between regulatory rules that were not known before.

Now mitigation is possible

“For example, consider that all the topics up until now had to do with a U.S. regulation and topic C was a policy that dealt with a European requirement. Perhaps, there is a linkage that is meaningful, or perhaps there is a conflict. Whatever the case, the matter can now be escalated to a solution by either bringing it up with the regulators or with management. But in every case, information is power, and the complexity (the unknown) levels of risk are mitigated by that very knowledge.”

Mitigation

Enhancing risk assessment

I liked this approach to impact assessment. It proved the power of a GRC framework, not only for the transaction and monitoring phase, but also for the inception phase. It expanded the risk tolerance exposure assessment from pure economic metrics to regulatory and, probably in the

slipstream of that, also social risk components, and allowed them to be weighted coherently.

This was confirmed by John's next example. "Now, consider a completely different approach to dealing with the risk elements. As can be seen, you now know the dependencies and the relationships between things. Let's say, that in the first picture you know that you cannot meet all the requirements of topic A, and the actual elements have been exposed. However, satisfying the requirements may cost more in terms of IT overhead, management, system and procedural change than you have the appetite for. You can now risk-adjust your decision to satisfy the demand of the regulation.

Going back to the regulator

"You can even go back to the regulator (something that may not have been possible in the past) and tell them specifically what the systems technology impact is for that regulation, and also the time and cost required in order to satisfy it. The regulator may adjust the compliance requirement, give you more time, lessen the burden, or provide an alternative solution. The important thing is that you know, and complexity becomes simply complicated."

Being able to plan and forecast budget

This was a long interview session in which I barely got a word in edgewise. John's argumentation was in full flow. Nevertheless, I gave it a try.

Predicting from multiple perspectives

"John," I said, "the next stage of this knowing is prediction. Not only being able to know in time, but also being able to know before in the sense of predicting the emergent and possible future. That seems to me to be possible, too." John confirmed that to date, because the models can be exercised outside of the current IT infrastructure, you can build models that can predict the effects of regulation on your business from every perspective: business, operations, technology, stakeholder value, etc.

Building rules in advance

"In addition," said John, continuing with a new line of argument, "using modeling in this extra-system approach also allows you to incorporate governance and regulatory rules of engagement in advance of their coming into law. In other words, you can look at a regulation, determine its impact in and across frameworks and the business, determine how to

make changes (well in advance) and, on the day that the regulation becomes law, allow those changes to take effect. The game of catch-up will be mitigated.

Being able to plan and forecast budget

“I have probably already said that regulations are growing faster than most GDPs, and that, in a world of economic decline they are, in fact, the fastest-growing industry. However, for international businesses, and those that transact business internationally, this means that there are competing local jurisdictions that may trump, conflict with or otherwise create turmoil with regulations that are in conflict with each other. Imagine, therefore, being able to not only model and surface these conflicts, but also adjust their risk weighting. This allows you to use an axiological approach to the value of the regulation, the governance policy and compliance to either. Moreover, you can use that valuation to determine future budget in making adjustments for the changes that may need to be made. This forecasting capability puts the business somewhat back in control of an ever-increasing level of complexity caused by unforeseen demands from regulators. In other words, you can plan.”

It occurred to me that the advantages that John described would appeal to the board and C level. The question was how it would appeal to regulators. John promised to answer this question after lunch.

The lunch volume led to the same overload problem as the previous day. It seemed to be a continuous issue.

Regulatory arbitrage

Regulators can see the direct impact

After lunch, John continued with his explanation as if he had never stopped: “For regulators, this is also a valuable tool,” claimed John. “Instead of dealing with generalizations like ‘It’s too hard’ or ‘I don’t have the infrastructure to support this,’ regulators can see the direct impact on businesses in real terms. They can make adjustments that aid in the implementation by perhaps softening, delaying or working with the business to come up with regulations (or better-defined regulations) that might work.

Interpreting ambiguity

“In real terms, regulations come in two flavors: those that are definitive and well understood, and the ambiguous and open to interpretation. In transactional systems, the models can

provide oversight for both: on the one hand, determining and mapping transactional events to actual rules of conduct, and on the other, intervening so that within the transaction, policy-makers, lawyers or compliance officers can insert interpretations of the rule and either A) allow the transaction to proceed, or B) interrupt the transaction until clarity is agreed. This is the overall difference between embedded controls that are built into transactional systems with preventative or repressive measures installed into the flow, and the concept of oversight, where transactions are interpreted by the rules of engagement and reasoned in terms of their appropriateness at the time and in the situation at hand by an externally managed control environment.

Multiple jurisdictions and regulatory controls

“Another reason why the external nature of the controls and oversight is important is that, as we have seen, there may be multiple jurisdictions and levels of regulatory controls. Embedding rules for systems in the U.S. may have unforeseen consequences in operating the same system in the UK. But more importantly, if custom systems were created for every regulatory agency, they would be almost impossible to maintain. Externally managed control environments enable risk management at the point of risk.”

Opportunity for regulatory arbitrage

John started to smile, saying, “The astute will also note that there is an opportunity for risk managers to engage in regulatory arbitrage. In other words, transactions that might otherwise be onerous or even banned in one location may be acceptable in another. The point is not whether this is right or wrong from an ethical standpoint; it is whether or not it is appropriate for the stakeholders. Business is, after all, usually a profit-seeking enterprise. The rights or wrongs can be debated only if they are known.”

Business transformation

How to get there from here

“But reviewing, you can now see that starting with topical approaches to regulations allows you to ‘get there from here’. By starting at levels you know you can manage, and by knowing the previously unknowable dependencies within and across frameworks, you can enable planning, responsiveness, budget, manpower and systems requirements; basically, the main factors in handling high-speed change.

**Trans-framework
collaboration**

“Interdependent frameworks also allow collaboration between contexts, roles, relationships and responsibilities. Testing with a common inference engine will allow multiple frameworks to surface connections not otherwise seen or, for that matter, foreseeable. In complex systems, this can reveal sparsely connected networks that were not planned, but are exposed by the goal-seeking nature of the inference mechanisms. This is an important distinction from reductionist methods that model specific processes and then interface them into the complicated (not complex) system. It means that it is the engine - as opposed to the business process analysts - that reveals the flow. Such revelations may be a catalyst for business transformations that would have otherwise been overlooked.

**Modeling as a business
opportunity**

“But let’s also look at other motivating requirements. Compliance, following the rule of law and general ethical behavior, is one aspect of regulatory management. But think of the modeling as an opportunity to create new business opportunities.”

John came back to his previous example of the cash flow opportunities and expanded it further.

**Liquid cover ratio
opportunities**

“As an example, the life blood of most businesses is access to capital. In many regulated businesses, the available capital is determined by the amount of Liquidity Cover Ratio (LCR) that is required to cover product risk in the corporate portfolio. Many of these products are placed in baskets of risk. Notwithstanding the complexity of the changes to the names, let’s just think of them as: tier 1, tier 2 and tier 3 (to be phased out). Tier 1 are pretty well known products with real asset values based on a number of determining factors like “fair value” and “cost basis but some companies use both terms in the same sentence which promotes ambiguity. As anyone who has bought a car knows, the cost basis is not the fair market value of the car when you drive it off the lot. tier 2 may be valued at inappropriate rates because although they may be exotic derivatives, a liquid market may exist for them which makes them really a tier 1 asset and some 70% of these assets may be illegitimately characterized with more risk than there is , Or, they are valued against some model with a matrix of valuation criteria and confidence levels that are arcane and complex to describe rationally. Tier 3 is simply anybody’s guess as to what the true risk and value is. This has

been termed “mark to myth” in some circles and will comprise assets in the tier 2 class going forward.

What a difference 5% makes

“Well if your LCR is aggregated at say 17% of your current liquidity then that is the set aside of capital you need to meet your net stable funding ratios. But let’s say for instance that we can map some of the tier 2 products (possibly 70%), against actual models of confidence and map those to regulatory rules regarding those valuation models and move some tier 2 risk to tier 1 and maybe even some tier 3 to tier 2. The net effect may be that the LCR can be reduced to say 12%. Now you have to ask the CEO and CFO what an extra 5% of available capital might mean to their operational, investment or investor activities. My suspicion is that they would thank you very much. Especially, if the models expressly (which they would), map to the regulations and show the exact reasoning behind the decisions. Now the CEO can look the regulators and stakeholders in the eye and say. ‘This is why I made the decision’. As importantly, the risk weighted averages may move on a daily basis depending on trading and operations. A dashboard that signals these changes would be a valuable tool for (near) real time regulatory oversight and capital management.

Sorry for that \$6 billion loss

“It’s a lot better than explaining to Congress that you don’t know what happened to \$1 billion in customer deposits. Or explaining that you don’t know whether your trading unit lost \$1 billion or \$6 billion, with the attendant loss in confidence represented by a reduction in market capitalization because your stock slumped by 30%.

Two-sided leverage

“This new form of modeling provides amongst others Real Time Regular Oversight that allows better planning, better control over the business, flexibility of response to changing market conditions and regulatory environments. And it allows the business to leverage the current systems and infrastructure they now have rather than replace everything wholesale”, which some regulators are considering.

We decided finish the interview for the day and go for a drink in the hotel bar across the street. While enjoying a glass of wine, we looked back and concluded that we needed to adjust our original plan. It seemed obvious to us that our next matter for discussion should be the technology that makes the described topical approach of regulations and policies feasible. Any remaining aspects could be discussed after.

I didn't know there was
technology that could
make this possible

John left early to pick up some medicine for his wife and bring it to her. His empty seat and the seat next to it were almost immediately claimed by a couple in their late fifties. We introduced ourselves. The lady in question turned out to be a manager of the legal department of an insurance company in the Boston area. I could not fail to ask her whether regulatory change was a burden for her department and the company. This was absolutely the case. Her department could barely cope with the impact of regulatory change, she told me. The burden of compliance and litigation represented a major bottleneck.

This led me to briefly explain to her the GRC framework concept that enabled once-only modeling of topic-based legal and policy requirements and multiple reuse. I also explained how this makes controls actionable, enabling them to be executed before the transaction takes place, thus creating a full reasoning tree of decisions, including the legal sources on which the decisions are based. "I didn't know there was technology that could make this possible," she said. "We certainly would benefit from such a technology." This conversation was an extra stimulus to focus on the technology aspect in the next interview session.

Part III:

What is the technology base of the future?

Introduction

That morning, Florida looked totally different. The sun had re-emerged and brought with it that vacation atmosphere the spring breakers were longing for. Since we were early, John and I were able to select a table outside that was far away from the pool. There we continued our conversation.

Past and future Based on the dialogue in the first chapter and the response of the lady from the insurance company, we concluded that the financial sector is being held back by technology that is incapable of delivering the functionality that is required in an era of dynamic change and uncertainty. This is probably true of all the other heavily regulated industries. It raises the question of what characteristics a new and innovative technology would need in order to make a difference.

If a company is being asked to invest now in a technology that should be of significant value in the future, it would be useful to have some idea of what that future will be like. Only then can one hope to reasonably assess whether the proposed technology investment will offer material advantage and reward. So I asked John the following question: “What are characteristics of the information systems of the future?”

Characteristics of the information systems of the future

Shifting views John took a moment to think before answering as follows: “In my opinion, there are a number of characteristics of future information systems that are already clear:

1. A shift from data towards knowledge
2. An increase in connectedness of people and their information-handling tools
3. A shift from obliging people to adapt to computers to enabling computers to adapt to people.”

Knowledge handled by the internet

According to John, the buzzwords that currently label or describe this shift are “Web 3.0” or “semantic web”. Both are internet-oriented technologies, John explained: “The reason that these technologies are identified as the relevant foundation for the future is that, while the vast majority of data is owned and managed by corporations, the vast majority of knowledge is being handled by way of the internet, mostly in the form of text, but increasingly in other forms.”

A brief sketch of some salient features of the past

Learning from the past

John continued by saying that, until the advent of the internet, software companies had aimed to establish market dominance by defining proprietary solutions and attempting to make their proprietary schemes de facto standards.

Proprietary systems used by corporations

“Initially, the customers for such software were corporations. Increasingly, businesses are operating as aggregates of individuals, and are increasingly operating on consumer-oriented machines - machines that have the computing power of million-dollar machines of a decade and a half ago. Large mainframes today, for instance, consist of swinging gates loaded with plug-in-card versions of these individual server machines.”

Shifting paradigms

According to John, Microsoft Windows is the paradigm instance of the proprietary strategy in action. He said, “As brilliant a technology strategist as Bill Gates is, he was taken by surprise by the internet and, as he documents in his book, his realization of its significance obliged him to turn his company on a dime to reposition for the strategic implications the internet (cloud computing) created. The internet has turned the hair of the Microsoft Corporation prematurely gray; that is, has turned Microsoft into a ‘mature corporation,’ positioning Google as the upstart and growth darling instead.”

Proprietary dominance shifting

“You know,” John said, “actions taken by Microsoft as a consequence of its market dominance had the practical effect of reducing to near-zero the market value of competitor software. The internet offered an alternative path to market and a different business model for the work products of all the software engineers who didn’t work for Microsoft. Ad revenue associated with web pages replaced software revenue sales as a basic business model.

Global resources dwarf individual companies

“Today, the army of programmers all over the world working to deliver software that works in conjunction with the internet dwarfs the resources of any software corporation, even Microsoft, Oracle, IBM and HP all put together. Furthermore, and even more importantly, the constant improvement of web authoring tools has effectively increased the number of ‘programmers’ working on the internet by many orders of magnitude beyond the number of people with the job classification of ‘programmer’.

The end of proprietary systems

“While software that is not internet-oriented will continue to be sold to corporations and individuals for years to come, those software packages will continue to evolve to be ‘internet-compatible’ or cloud-based. The sheer global scale of the internet and the vast pool of talent working on it will ultimately put an end to the proprietary software business, except in niche markets,” John predicted.

It is time for a *do* technology

The rise of metadata

With that sketch of some of the leading characteristics of the past in mind, John turns to a consideration of the future: “The technologies being developed by W3C, the consortium that establishes, publishes and maintains internet technology standards, are varied and target different challenges, but have, in broad terms, a common characteristic, in that they define methods for creating metadata that is machine processable. Metadata is data about data.”

Standards define descriptions

He emphasizes that computers cannot process people or things. “Computers can only process descriptions of people or things, so the Semantic Web standards concern themselves only with such descriptions.”

Descriptions don’t *do* anything

“What about these standards?”, I asked. “All the new Semantic Web standards have a common characteristic in that they are passive,” John continued. “Consider, however, the impact this has on the way the world works. As descriptions, they don’t *do* anything. They just sit there waiting for something to do something with them. This is true even with the best intentions of the Object Management Group, with such efforts as the Financial Industry Business Ontology (FIBO) and the closely related efforts of the Enterprise Data

Management Council (EDMC) in defining classes of financial descriptors to be used in such ontologies.

Getting a grip on standards

“In addition, regulators around the globe are trying to get a grip on these emerging standards. The SEC has mandated the use of technology as business reporting XML, although they do not use the technology to any significant advantage.

From nouns to verbs

“This is not a criticism of the emerging semantic metadata standards,” John says. “Defining such standards is necessary foundation work. But clearly, that can’t be all there is to it. We can’t have a useful language consisting only of nouns and adjectives. We need a technology for doing things with all this information. We need verbs and adverbs.”

Descriptions are no substitute for actions

John puts forward as an argument that metadata has the same relationship to an underlying information resource that a sign has to a store: “When you hang out a big sign over your store, you haven’t actually done anything. You have enabled others to do something if they so choose. Stores without shoppers are of little use whether the stores have signs hanging out in front or not. Think of concepts in models and the relationships between concepts as shoppers in the world mall of information.”

Open-concept models replace the application suite

“What about these concept models?”, I ask. “Models do things,” replied John. “That is the purpose of the ‘concept modeling’ technology. Concepts and their relationships are a means for getting things to happen. They are a means for getting things to happen that does not produce a proprietary vertically integrated ‘application,’ or even an ‘application suite’. They are a means for getting things done in an open, pluggable knowledge-processing infrastructure that will be initially developed for use inside the corporation,” he predicted.

“Sorry, John,” I said. “Now you have lost me. Could you please elaborate on this concept computing. What is it, what does it do, and what is the crucial difference?”

Concept computing

“Sure, with pleasure,” John responded. “Concept computing is the term I prefer; others call it semantic computing or

knowledge computing.” “Aha!”, I said. “So it has to do with processing meaning?”

A transformative technology

“Yes, indeed,” John replied. “To quote Lou Gerstner of IBM, ‘Every twenty years or so, in IT, a new technology emerges that, by virtue of its exceptional ability, is able to address an entirely new class of customer problems.’ Such a technology transforms the way people work, improving productivity by providing non-linear improvements in performance. Now, for the first time, a new technology has emerged that breaks the bonds of the previous paradigm and allows pure semantic computing to emerge, putting the power of computing in the hands of domain experts, and facilitating a leap in productivity. But that’s not all! Concept computing shifts the paradigm of value from process and data to decisions and actionable computing: the next great value enabler in computer progress.”

“Wait a minute!”, I responded. “Do you mean that concept computing enables an organization to support or even automate decision-making? That is exactly what the industry is looking for.”

An expected paradigm ahead of its time

John nodded affirmatively and explained: “Concept modeling is a new way of creating support systems that does not use traditional computing analysis and design models. Concept computing uses semantics and executable models tied to inference engines to deliver rapid processing capability associated with rules. The meaning derives from networks of relationships between concepts. Another important point is that they are modeled separately from IT systems.”

Faster, better, cheaper

“It is faster, more adaptive and more flexible. Some refer to this as agility. Since the IT systems are a service to the models, there is no danger of infrastructure corruption, interference with current data and systems or major operational overhead.”

New user experience

“By contrast, concept computing delivers a new user experience closer to natural human processes. It synthesizes functionality into capability standards and higher-order solutions. Last but not least, concept computing empowers breakthroughs in value and life-cycle economics with measurable results.

Businessmen, subject-matter experts and operators are now part of the team

“Business users and their experience become central to the development process. Models operate more closely to the human experience and are understandable to mere mortals.

“More importantly,” John continued, “since the business owner is empowered, new breakthroughs can be expected that increase the value to all stakeholders.”

You can’t have it now, but you can have it when you don’t need it

“A major complaint of business users is that they cannot get what they want fast enough, or they are put on a waiting list for development where the maintenance of current systems is well ahead of them. Sometimes opportunities in the business world are lost because there are no support systems available. Concept modeling eliminates this problem.”

At my request, John named some important characteristics:

- “Concept models link sources, connect knowledge and data, and enhance context
- Concept computing integrates data, decisions and actions
- Concept computing is goal-oriented
- Concept computing monitors pre and post-conditions
- Concept computing facilitates decision-making with reasoning, applying rules and conditions.”

I know what a rules engine is

That last characteristic caught my special attention and, pretending not to know, I said, “Hold on, please. You are talking about a rules engine, aren’t you? John shook his head. “No, that is a mistake many IT executives make at the moment. They misunderstand the rules aspect of concept modeling and refer to these systems as ‘rules engines,’ he said. “Nothing could be further from the truth. Inference engines align with the concepts and interpret certain conditions as rules or, in most cases, pre and post-conditions of an open architecture of available next steps.

Models can leverage and augment existing IT investments

“They reduce the need for thinking of every potential rule pathway because they find their own path. This eliminates the entire ‘what if/else’ paradigm. Existing schemas, ontologies, models and business logic can be imported using open standards. Imported linked data and ontologies in RDF and OWL can be connected to analytic, decision and process models. This concept technology can also combine ‘natural’ language understanding with semantic models to extract and apply knowledge and information from unstructured sources.”

Leveraging work done It almost started to dazzle me, but John continued imperturbably. “For advanced IT departments that have built ontologies of the business, that are static representations of the connectivity of units and process and their relationships, concept computing allows them to be imported and implemented as processable applications. This leverages the work already performed and demonstrates the value of that work in operational modes.”

Enabling computers to adapt to people

What John told me was very exciting, since it announced a shift from obliging people to adapt to computers to enabling computers to adapt to people.

Computing is finally enabling people to work the way they want to John also recognized this trend and told me that the very starting point for enabling computers to adapt to people must be a description that a computer can use that characterizes the person and his or her information and knowledge-oriented requirements; it is a fundamental requirement. He repeated that this is the grass-roots basis of concept modeling technology. It deals with a user’s conceptual framework, in the language they use to do the work they do in the way they want to do it, with the information and processes that are only relevant to them in the context in which they are working.

Intelligently configured models service role-based activity John concluded his explanation of concept computing with the remark that, currently, users are offered applications. “The shift involved here is a shift away from ‘applications’ towards ‘intelligently configured services’ that are intelligently configured by the knowledge processing infrastructure based on the user’s world view. They are delivered by the concept computing modeling tools and their supporting components in the knowledge-processing infrastructure, perhaps networked together with knowledge fragments of others in such a manner that new emergent properties of knowledge are revealed.”

In my opinion, that last aspect that John addressed, the emergent properties, needed some further elaboration, certainly because the question may be asked how all these concepts can be integrated into a fully workable and reliable system or system of systems. I therefore asked John to go into more detail, a request he was all too willing to fulfill.

Emergent properties

Understanding emergent properties and unforeseen risks

“Clearly, understanding the rules of behavior within a single system is reducible to levels of understanding that allow its deconstruction, reconstruction and full understanding of the implications at the micro and macro levels. Such detail makes the outcomes knowable. However, understanding the interactions between multiple systems with differing goals and means of achieving them in an integrated and holistic system creates the problem of ‘emergent’ properties that, in turn, create unforeseen risk.

On the edge of chaos

“In many ways, what we are discussing is recognizing that businesses are in a state of rapid change. They are, in many cases, on the ‘edge of chaos’. That may sound dangerous, but in actuality it is a very positive place to be (if and only if you are prepared for the consequences). These emergent properties come from a rearrangement of patterns within the enterprise and its connections to the outside world.

Defining optimal systems using a clear lens

“Think of it this way. Many businesses look at the patterns of behavior and processes in their enterprise and try to capture them, creating a virtual snapshot of how things operate today. This snapshot is taken through a clear lens and optimal systems can be defined and built from it.

What if the lens becomes a kaleidoscope?

“While the elements of the business may remain the same, the patterns reveal themselves more like they would through a kaleidoscope than a clear lens. Living at the edge of chaos in this world means that you are literally operating within a deformable landscape. It is like walking on rubber: once you feel stable, the landscape changes and you have to adapt all over again.

“What this means is that while you are changing, the world you communicate and operate with is also changing. The fitness and survivability of the business depend on the ‘viability’ of the systems available at the time.

The optimal is not viable anymore

“So, instead of building the ‘optimal’ system, which is possibly the best system available at the time, it may become unviable if even slightly affected by changing circumstances.

Suboptimal may be more adaptable, and thus more viable, when dealing with change

“What this infers is that designing conceptual models that perform suboptimally may be more adaptable, and thus more viable, when dealing with change. This deals with the IT issue of worrying that inference engines and models may be slower in operation. However, if they are adaptable they will survive where optimal systems have become defective and come to constitute an obstructive nuisance.

“This translates to what I would call a ‘local optimum,’ which means that in a deformable fitness landscape, survivability of the business has a greater set of odds in its favor.”

Antifragility

“That’s is interesting,” I remarked. “This reminds me of the antifragility concept of Nassim Taleb (Taleb, N., 2012), a man with some experience in risk-taking business. You are, in essence, describing the same capability. It allows you to survive and seize opportunities.”

Fluidity is the key

John nodded and continued: “Not to get technical, but operating at the edge of chaos enables the recognition of ‘phase transition’ opportunities. This is where the adaptability and fluidity of operations support change. Fluidity is the key. With the concept-computing model, deeply frozen systems move towards more fluidity, increasing the enterprise’s ‘fitness for survival’.”

Creating a new emergent order

“GRC environments are complex systems with interdependent links to assure compliance. They require a different approach because ‘emergent’ properties are often unknowable, which defines complexity. Orthogonal design and non-linear dynamical capabilities can aid in the solution to dealing with complex systems because emergent properties can be surfaced as anomalies (unforeseen consequences) and structured to create a new ‘emergent order’. In other words, once known, replicated and tested, the new holistic system or trans-framework architecture becomes knowable and thus orderly.

“This same orthogonal design, which is knowable in the context of its design and models of behavior, allows topics to be addressed at the user, department, division and enterprise levels, individually, with the confidence that the ordered collection will also work as an integrated system. This is because the declarative method of implementation is separated from the flow controls of the processing.”

Multi-reality user experience

“So you mean that the user will not be overloaded with too many, and perhaps contradictory, instructions?”, I asked. “Indeed,” John answered. “For the user, the boundaries of their requirements to provide their service level is constrained by what they are doing and the context in which they are doing it. This is a dynamic activity. Here lies an important distinction in operational control, in that the very same user can operate within a totally different context and have a completely different experience, once again constrained by the role, relationship and responsibility.

Being responsible within the constraints of management controls

“One level above, management may be viewing their responsibility in the context of departmental controls as defined by an internal policy. Their activities are constrained by the context, and when a role changes, the context changes. At the divisional level, management will be constrained by the activities applicable to them with the subfunctions inherited by their ‘world view,’ which is another term for the role relationship responsibility context. Subordinate activities increase in control level, while best practices are pushed down to the operator level in the context that is needed within the framework of activity.

Dealing with anomalies

“Anomalies, disjoins and conflicts in and between frameworks can now be surfaced and dealt with in a timely fashion, and before they constitute a compliance problem in one context and a non-compliance problem in another. Once knowable, they can be dealt with, and the complex and unknowable become the complicated yet knowable, making them a completely different animal to deal with.”

Arbitrary truth

Truth is arbitrary, so a single source of truth is too

“But doesn’t a single source of truth obviate such problems by forcing controls across systems?”, I asked. “No, and why is this so? Some argue for a central source of truth to assure integrity of data and processes. But this is, to some degree, nearly impossible because of the sheer volume of variables that need to be tested. Equally importantly, from a philosophical and practical view, truth is arbitrary, in the discretionary sense. The fact (or a truth) is that all truths are true ‘in a model’. In other words, the model that facts operate in dictates the truth in the context it is being used in. It’s a long and complicated subject, but at the end of the day designing systems is designing within a model of desired outcomes

within a framework that supports them. So what is true in one model using identical facts may not be true in another. We see this every day in our interactions with human beings.”

The concept of arbitrary truth resonated with me, and I remembered earlier discussions about the multidimensional nature of what we can know. Both truth and knowledge are polyvalent and not monovalent. Validating and warranting is needed, and context and feedback matter. Meanwhile, John came back to the reasoning aspect.

Reasoning exposes the foundation on which the truth is based

“This brings us back full circle to reasoning. By using reasoning-based systems, the foundations of the truth under discussion or operation can be exposed. In other words, all decisions can have full traceability and, for that matter, full transparency as to how and why the decisions were made and what truth they were based on and within which truth paradigm. This means that a human can begin to understand the complexity of the systems they are dealing with, and even foresee possible emergent properties that can become problematic. The closer one can predict these problems, the lower the overall risk in operations. Moreover, it becomes explicable, which is important when large fines are looming or your freedom is on the line.

The topic creates its own “sparse network” of linkages

“One of the barriers to providing regulatory controls as a service has been the complexity argument. Furthermore, when dealing with the problem in the traditional linear fashion, it is problematic from both a systems and infrastructure perspective. However, regulations are designed for the regulated, and there is a limited set of those businesses. Moreover, regulations are topical; they deal with higher-order functions that have a network of detail but are still limited to a particular topic for a particular purpose. For instance, our example of duty of care is one topic among hundreds, but the network of linkages between and across frameworks will be limited to a knowable and controllable subset. In other words, you don’t have to know what is happening in an unrelated topic to get your answers. The topic then creates its own ‘sparse network’ of linkages.”

Emergent order and sparse networks

I was only vaguely familiar with the theory of sparse networks, so I felt compelled to ask John to explain it in more detail.

The science of emergent order

“Don’t forget that the notion of the declarative models of behavior separates the requirements from the process of performing those requirements,” said John. “A separate inference engine performs the activity, seeking to achieve the goal of the topic, and ‘it’ finds the network of relevant linkages. Some of these may at first be run as a surprise, but once known it they simply a complicated network of interactions and, of course, knowable. This is part of a science that deals with emergent order and came out of genetic research using computers to simulate complex genetic outcomes of switching on and off certain genes. Instead of billions of possibilities, it turned out that the number of possible switches was limited by topics. To put it in context, an eye gene was not in the same network as a toenail set of gene switches, meaning that that network was ignored until it came time to test for toenails.

The network of possible connections is limited

“The same notion applies to regulation. Although there are tens of thousands of regulations, there are some that are specific to industries, some that cross industries, and some that cross frameworks within an industry: the business, the customer, the operations, IT support, etc. These can amount to billions of possible connections. At the end of the day, however, the network of all possible connections is limited and knowable because the inference engine will find and limit the connections to only those that meet the goal that is in process of being met. Here, a globe of dense networks with a limited set of lit-up connections might make the point.

Cross-boundary connectedness

“The ability to provide context across and between frameworks and make complexity knowable through sparse network connections also facilitates ‘governance as a service,’ whether as an outside facility servicing an industry or one installed in and across the enterprise, servicing the needs of the compliance officers.

Transparency and traceability in one

“It facilitates a central control mechanism that monitors all events, provides advice and consent features and maintains a complete record of all transaction history at the point of performance. This transparency and traceability are found in the sparse networks, which link to the reasoning engine, map to the regulations and provide a previously unheard-of facility for reducing compliance overhead by orders of magnitude. In addition, they assure stakeholder confidence and adapt to

changing conditions faster than any rival alternative. Such a facility is the objective of real-time regulatory oversight.”

New rules join the party

This made the concept of sparse networks clear to me again. John’s argumentation made sense. “But what happens when new rules are promulgated?”, I asked. John smiled and said, “The same mechanisms that provide the ability to create and surface sparse networks will allow the inclusion of a new rule with all the new connections surfaced, connected and utilized in the reasoning engine. This is hard to believe, but true. Imagine trying to do that by mapping out all the possible connections. Let’s put this in perspective,” he said.

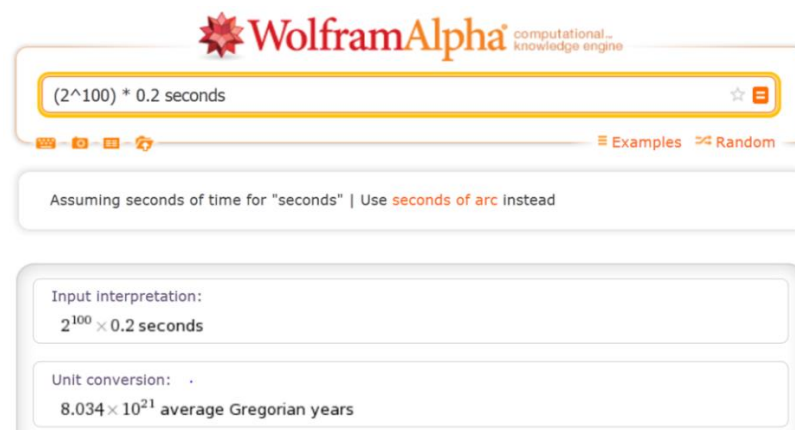
Traditionally processing a hundred-rule system would take longer than the universe has existed for to date

“Let’s say you have one hundred rules that can be combined with only two possible outcomes: true or false. So rule A is true or false; simple enough for one rule. Now suppose that you need to test for rule A and B, and this network now has four states: true true, true/false, false/true and false/false. A further network of three rules would have eight states: $2 \times 2 \times 2$ and so on until you tested for all one hundred states when you would have to test for or one million trillion trillion tests. Or, to put it another way, you would need longer than the universe is thought to have existed for to test the results. No wonder the complexity of a simple hundred-rule system scares the living daylights out of designers.”

But order emerges

I started my laptop and checked the formula in Wolfram|Alpha. John was right. I even tried a calculation in which I assumed that every test took 0.2 seconds. The reader may also want to try this.

Figure 16: Complexity of a traditional hundred-rule system



Source: Wolfram|Alpha, 2013

It resulted in really dazzling figures that put preferences for using traditional rule-based systems in a whole different perspective. John confirmed this and continued: “However, as has been proven time and time again, it turns out that the cycles quickly develop ‘emergent order’ and develop limited networks of connections or, as we have said before, ‘sparsely connected networks’. The combination of inference mechanisms, and constraints (within roles, relationships and responsibilities) limits the full set of possible networks to manageable behaviors. However, you need the engines to make this happen, and finding them manually would take an army more time than the predicted cold end of the universe.”

That was the perfect point at which to finish discussing the technology aspects. We didn’t want to go into further detail because it might not be of interest to the majority of the readers of this publication. The sun was still shining and we decided to go for a walk.

Part IV

How to realize governance as a service?

Introduction

Limits to the absorptive capacity

While walking towards the beach, we passed the restaurant where I had lunch before. I told John about my “overload” experience and thoughts about letting someone else deal with the overload portion of regulation. John laughed. He had witnessed that same restaurant problem with Europeans before. Saving food for later consumption was no problem in the U.S., but saving legislation for later implementation entails huge risks. If the absorptive capacity of organizations is not sufficient to cope with the volume, another approach is required. So finding another party that helps you to deal with the regulatory overload was certainly an interesting and feasible idea. That concept is, in fact, called “governance as a service”.

All doing the same tedious thing

Governance as a service is feasible and desirable

John reminded me of the 14,000 new rules and 60-plus-a-day new ones. He said, “Governance as a service with such a volume is not only feasible with the technology we discussed, but, frankly, a practical solution to the multiple islands of similar activities taking place in regulated businesses across the globe.” John quoted some statements of Willem Dicou, a very seasoned colleague at Be Informed:

“You know, all doing the same tedious thing. Replacing it with a single service providing real-time regulatory oversight can change the paradigm of running the business and assuring compliance across both internal and external policy rules.”

No harm intended

“Note that the compliance rules for all organizations in a particular segment of the industry (banks, insurance companies, pension funds) are the same. Besides, the policy-makers (government/politics) and the regulators do not, as such, have a charter to increase regulatory and monitoring pressure, but are forced to do so due to the inability of the industry to prove its compliance and proper governance.”

A common approach

Possible solution	<p>“So what is needed according to Willem?”, I asked John. His answer was clear. “Because the problem is the same for all financial institutions in the market, a common approach for tackling the execution of compliance (other than, for example, risk management, in which the company policy, market positioning, etc. play a role) is worth considering. This has the potential to lower cost and burden for everybody.</p>
More effective monitoring and lower monitoring pressure	<p>“Such a common approach establishes common ground for all stakeholders (policy-makers, regulators, financial institutions). This allows for more effective monitoring and lower monitoring pressure.”</p>
Better image	<p>John continued: “Demonstrable compliance, executed by an independent and impartial party, will deliver a better image for the whole industry. Corporate social responsibility (CSR) can then be applied to compliance in the financial industry as well. After all this, it is really a matter of restoring public trust.</p>
Trustworthy and independent party	<p>“When all stakeholders invest together in one trustworthy and controllable platform, the costs for everyone will decrease even further. This requires a trustworthy and independent party that offers such a platform to the market in a secure way and with high-volume capacity.”</p>
Shared body of knowledge	<p>To my question of what else is needed, John replied, “For the management and maintenance of the various regulations and the resulting controls, a ‘body of knowledge’ can be instituted in which all stakeholders participate and provide supervision. Advantages include the following:</p> <ul style="list-style-type: none"> • Shared interpretation of regulation, leading to unambiguous and effective controls, and reports • Full transparency and traceability • Shared costs • Shared knowledge.
From compliance costs to compliance revenues	<p>“When the reliability of compliance controls and reports increases, financial institutions can lower the safety margins they now take into account for their capital requirements, i.e. greater reliability decreases the probability of the regulator retrospectively concluding that the reported figures were wrong. The positive effect of this is that the credit facility of</p>

financial institutions increases along with new revenue and profit potential.”

Increasing trust

Increased trust I told John about the development in the Netherlands of the concept of horizontal monitoring by the Dutch Tax and Customs Administration. The concept is certainly related to what John described. It could be an extension, or even better a result, of applying governance as a service. It has also an analogy with the knowledge-based trust level that was discussed in the first chapter.

Horizontal monitoring

Quote: horizontal monitoring

Horizontal monitoring

The working method of the Dutch tax authorities is changing from vertical monitoring towards horizontal monitoring. Where vertical monitoring is based on checking retrospectively, horizontal monitoring is a form of working in the present based on mutual trust, understanding and transparency between the enterprise and the tax authorities. Horizontal monitoring consists of two elements: a good relationship between the tax payer and the tax authorities (recorded in a compliance agreement), and good risk detection, based on what is known as the tax control framework. The actual “working in the past” is replaced by “working at present.” By applying horizontal monitoring, the Dutch tax authorities try to arrive at a method of compliance. This means that entrepreneur’s voluntary will comply with the application of the law and regulations.

Advantages of horizontal monitoring are amongst others:

1. Certainty in advance

By applying horizontal monitoring, “working in the past” is replaced by “working at present”. The entrepreneur will act with a transparent attitude towards the tax authorities and the latter will provide a fast judgment about the tax situation of the taxpayer. Both parties will not any longer find themselves in a situation of insecurity. In addition, the taxpayer will have a fixed point of contact with the tax authorities.

2. Less rigorous audits afterwards

Working at present means that future tax audits and relating points of discussion with the tax authorities will be avoided. Under the system of horizontal monitoring tax audits will only be performed at random. The tax authorities have expressed their intention that entrepreneurs not taking part of the horizontal monitoring will be subject to tax audits in the future.

Source: www.foreigninvestments.eu

Increased reliability and trust

It seemed to me that, in line with what the Dutch Tax and Customs Administration has achieved with horizontal monitoring, the effect of increased reliability can enhance trust between policy-makers and regulators and the financial

institutions. Therefore, in the course of time, the required safety norms can be adapted, enabling credit facilities to again be increased with new opportunities for growth.

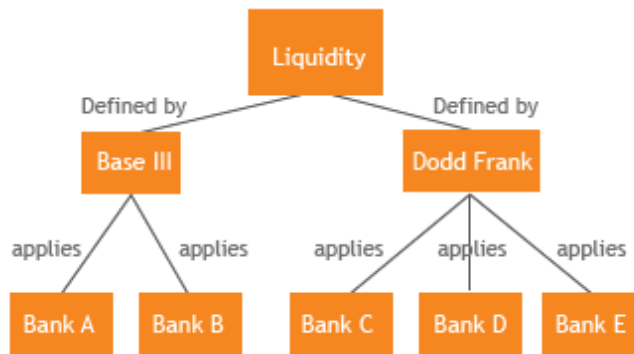
The obvious question to John was whether this is manageable and scalable on a larger scale.

“Is it manageable and scalable?”

Ontology-based product management

I was wondering whether an approach that spans multiple financial institutions and duties of care still is manageable. According to John, a semantically driven business process platform enables not only the management and execution of knowledge-intensive processes, but also the management of knowledge-intensive products. An ontology is used to model the topics customers are interested in. For instance, providing international compliance on liquidity by managing, for instance, Basel vs. Dodd-Frank requirements is an important feature that would provide instant value. Multiple banks and other financial institutions would be interested in a service offering. A simple ontology describing banks applying differing liquidity policies is displayed in the following image.

Figure 17: Banks using different liquidity rules

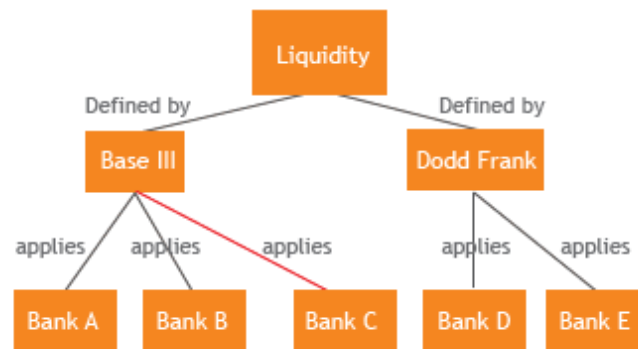


Source: Be Informed, John Coyne, 2013

Split-second changes

In the simple example above, banks A and B utilize the Basel liquidity tests and policies. This operational model executes the actions necessary for compliance, so banks C, D and E will use the Dodd-Frank rules and policies. I asked John what would happen if bank C no longer applied Dodd-Frank and needed to use the Basel tests. John’s diagram below shows the simplicity of using models to execute change.

Figure 18: Changing liquidity application



Source: Be Informed, John Coyne, 2013

The transfer of a relationship changes the rules of liquidity checks. Above, the simple relationship of bank C (red line) is diverted to Basel, and now all the rules used by bank C will apply the Basel model. It is that simple to execute what would be a complex change in any other system.

This led me to ask John the obvious question of why it doesn't exist yet.

“Why doesn't this exist yet?”

No more “more of the same”

John paraphrased the previous statements of Willem Dicou by saying, “Compliance and accountability have always been there, but not to the degree we have come to know over the last couple of years. The adverse events in the financial industry have caused an exponential increase in the number of regulations. The way the industry responded was with ‘more of the same’. This was, in effect, the arduous post-collection of data and evidence and delivery of the reports required by the regulators. However, with the huge number of regulations and the speed of changes, this ‘brute force’ approach is no longer viable. Meanwhile, once they discover they no longer have to accept this ‘afterthought’ reporting any longer, the regulators may decide not to.

The cost is increasing exponentially

“The cost of the traditional approach is increasing exponentially for both the financial institutions and the regulators, while the level of compliance and the quality of reporting is lagging behind.

A paradigm shift is needed

“A paradigm shift is needed to solve the problem - in real time, with embedded compliance, horizontal monitoring and a commonly supported solution which:

- provides enforcement options for compliance automatically
- is reliable, transparent and traceable
- is practicable at a reasonable cost level.

This shift is not only needed at the enterprise level, but also at the industry level.”

John concluded his view with an appeal: “Let’s not forget that non-compliance, or the inability to prove it, causes reputational damage for both individual financial institutions and the entire industry.”

Subsidiarity as an option

How to lower the barrier

I tried to imagine how one best could realize the concept of governance as a service. I expected that it required a pulling force from some large and committed market parties, but also a smart approach to lower the barrier for pre-competitive collaboration.

Proven EU practice

That reminded me of the concept of “subsidiarity” that is used in the European Union. Subsidiarity entails the idea that a central entity should have a subsidiary function, performing only those tasks which cannot be performed effectively at a more immediate or local level. So it is a federated approach, not a centralized or totally decentralized approach. In this case, the central entity could provide the interpretation and control services based on regulation. A local or multinational enterprise could add their own controls, based on their goals, objectives and risk appetite. In a large enterprise, there could also be a unit or line of business that defines its own controls within the boundaries of the enterprise.

Time value and cognitive value

So I told John, “The result is harmonization with respect for autonomy on the one hand, and distribution of work on the other. It also preserves the option of outsourcing ‘local’ parts of the work to your own trusted provisioning party on a contractual basis. You will probably negotiate with parties taking into account the time and cognitive value of the provided services.”

After the walk, we discussed which topics still needed to be covered in the interview series. Since there was only one day left, we decided to spend the next day focusing entirely on the question of how organizations can realize that transformative approach we had discussed in various ways.

I was well aware of the fact that John's notes, which I had read, contained more valuable insights. We agreed to add at least a selection of observations, pains and their solution to this publication. Interested readers can find this selection in the appendix.

Part V:

How to start your transformation NOW!

Introduction

The next morning, the sun was shining bright. We started our conversation by looking back over the past few days, in which we had found that a paradigm shift is needed to enable organizations to cope with the disproportional burden of compliance. We found that this shift can provide crucial benefits, both reputationally and business-wise. We discussed the concept of real-time regulatory oversight, working in spontaneous networks and managing meaning via a topic-based approach across frameworks. We found that a semantic technology is needed that enables you to deal with the inherent non-linearity of actual operations in the real world, and that this creates the real power to adapt and transform.

This summary brought us back to the theme of the day: “How to transform?” It seemed to me to be inevitable that we should start with the aspect of leadership and managing change.

“Talking about leadership and managing change, do you know how I position them in the governance risk and compliance space?”, John asked. I didn’t know, and then John came up with a striking metaphor.

Playing jazz

In the groove “You may know that I’m something of a musician myself. Consequently, I see a strong analogy with playing jazz. In jazz, we musicians really enjoy performing together, and at the same time excel in our own field of capability. There is one leader who sets the melody and the pace. Within these constraints, we ‘do our thing’ - sometimes in a solo, sometimes backing up another player, and sometimes playing together in changing constellations. The path is not determined, but the goal is clear. In the end, the participant (active and passive) must be satisfied and feeling good. Our

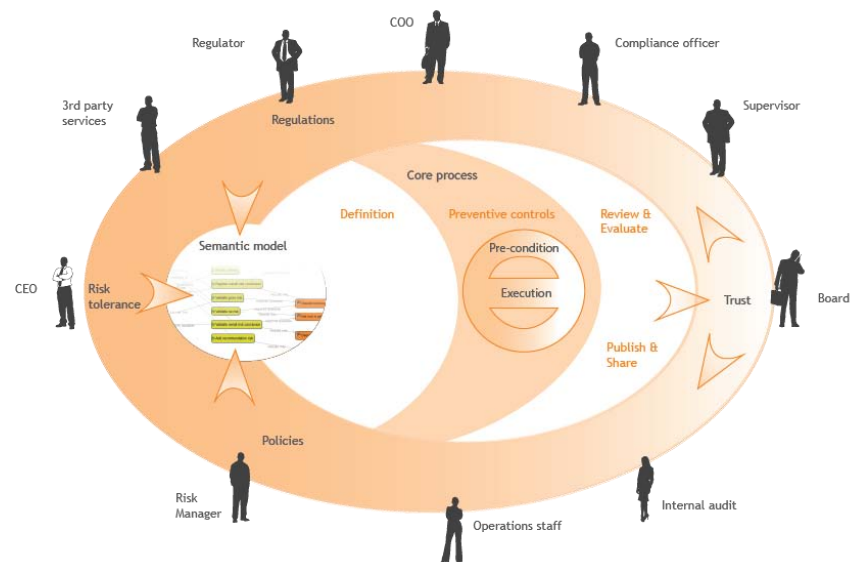
goal is to ‘get in the groove’ - a flow where everything happens automatically and almost effortlessly.”

I liked that analogy. John was talking about a kind of connectedness that fitted perfectly within the increased engagement trend that is depicted in the virtuous spiral of the first chapter. So I asked him about the role of the director in the ensemble.

**Ensemble means
“together”**

John looked surprised. “Ensemble,” he said. “That word says it all, doesn’t it?. ‘Ensemble’ means ‘together’. If we take the oval image and add some of the musicians to it, it would look like this.” John added a selection of roles to the image.

Figure 19: The GRC jazz ensemble



Source: Be Informed, Thei Geurts, 2013

John said: “As you can see, it can be become a very large ensemble that definitely needs a leader: an individual who sets the principles and guidelines for behavior and working together, and knows that musicians are averse to command and control, but still need direction. Someone who has vision and drive, who wants to perform at the top level, and knows that the best performance comes from facilitating and fostering the diverse talents in the group.

“Come to think of it, did you know that there is a difference between leading an orchestra and a jazz ensemble?”

Threat or nutrient I didn't know what John meant, so he explained it to me: "An orchestra is a streamlined machine that practices the execution of a well-defined piece of work. It doesn't like continuous - and certainly not unforeseen - change. All ambiguity is expelled. In jazz, like in the real world of financial services, there is always room for ambiguity and flexibility. It is in fact the nutrient for customer-centricity, operational excellence and uniqueness. In practice, organizations in heavily regulated industries are, at present, not able to play like an orchestra, let alone to play like a jazz ensemble. They are faced with a cacophony of sounds of ad hoc trials and of recommendations about what to do. Nothing really works. It's time to try something different.

Leadership in the 21st century "Real leadership in the 21st century requires many of the talents of a contemporary director of an jazz ensemble. It is about setting the direction and constraints. Because you don't want a cacophony, there are constraints on key transpositions and simultaneous beat or rhythm. It's also about knowing the trade, being able to organize and respond to new situations, and maintaining direction while being open to other insights and possibilities, respecting professionals, allowing autonomy within the purpose and meaning of the whole group and, of course, keeping the pace."

John concluded: "It may be a new way of working for enterprises, but for jazz musicians it is proven practice."

Building an engagement network

New way of working I liked the metaphor that John used. Jazz is more often used as a metaphor, but, to my knowledge, not in the GRC space. It gives an indication of which direction an organization must take in order to transform successfully. It is the direction of what is often cited as "the new way of working". The concept is often used too narrowly. In my opinion, the new way of working brings multiple disciplines together in a flexible, coherent and meaningful context to realize business goals. It is a reason for all actors to consult, communicate, cooperate and coordinate - in short, to collaborate. It respects main employee motivators like mastery, autonomy and purpose, and makes them possible without compromising the need for overview and control. Actually, one of the key ingredients of Be Informed is its ability to develop

spontaneous and dynamic collaboration, a feature unheard of in traditional systems. This spontaneity is also a key jazz concept.

Figure 20: The new way of working



Source: Be Informed, Thei Geurts, 2012

Higher productivity and greater commitment

“So, you are right, it its very much like playing jazz, but then in the context of an enterprise or public institution,” I said. “There is a general tendency to move from a command-and-control approach towards a more balanced approach for providing direction, facilitating professionals and enabling them to excel. Contrary to what some people expect, it results in higher productivity and greater commitment.

“I vaguely remember a definition of the ingredients of work as ‘the questions and commitments and possibilities that bring things forth’. I don’t know the source anymore, but it fits very well in the concept of spontaneous networks, or in jazz terms ‘spontaneous jam sessions’. Collaborators can ‘sit in’ on the fly and ‘jam’.”

“Another important word in that definition is ‘commitment’. You need an ensemble to jam with. It needs to be a group that is engaged and willing to play a part in the piece. So it will probably depend on the jazz capability of your workforce

whether you can start with one or more small ensembles that ultimately come together in one massive jam session. If a certain capability is missing, you can fly in guest players to join the ensemble.”

Last but not least, I see also a clear connection to the aspects of managing meaning and sense making.

**High-quality instruments
needed**

John obviously liked the references to the jazz scene. However we needed to move forward to the enabling technology aspect. Like a high-quality ensemble needs high-quality instruments, the same applies to the GRC scene.

The next two sections offer a brief reference to innovative technology that meets the requirements previously discussed, which, by its nature, can be described as highly transformative. Since this aspect of the discussion is of interest primarily to the technology-oriented audience, it will not be discussed in further detail here.

Leveraging business technology

The business technology that can leverage the ambition that is expressed in this publication is finally available. This proven, scalable and reliable technology is now being introduced into the commercial market. With a proven track record of high-performance governance, Be Informed’s Governance Risk & Compliance group is ready to bring this innovation to globally regulated industries.

**Prescriptive solutions at
the transaction level**

Be Informed stands alone in providing total prescriptive solutions at the transaction level. This means that at each stage of a transaction, Be Informed’s technology can monitor for compliance and risk at both the internal policy and government regulator level. Where regulations are well understood, this can provide productivity gains in the various role relationship layers within an enterprise. Where there is ambiguity, you can surface those ambiguities for management intervention and legal opinion. Furthermore, once established, the interpretation becomes part of the straight-through processing facility that streamlines the activity.

What’s more, these decisions are recorded at the time of the transaction, and a real-time audit provides both management and regulators with an “in-time snapshot” reference as to why

a transaction was deemed either compliant or non-compliant, and allows management to control the compliance risk.

Increasing STP by 99%

Be Informed's GRC initiative comes from increasing experience in delivering applications that have yielded figures like improvements to orders of magnitude in change adoption (days instead of months), increases in straight-through processing (STP) as high as 99%, reductions in licensing costs for communication systems, and the replacement of infrastructure for a reduced footprint.

Living together - the old with the new

Evolution, not revolution

We both prefer transformations on the basis of evolution. As John said, "There is an implied requirement that will be, at least intuitively, obvious to any person with any significant experience working with computer system infrastructures. That is the need to evolve a system to the next level of functionality while leaving the current level of functionality intact.

Non-invasive technology frameworks

"In technical language, this means creating a knowledge processing middle or supra-ware infrastructure that interfaces with, but does not damage, the information processing infrastructure already in place. That is the purpose of a non-invasive framework technology that may incorporate such technical aspects as service-oriented architecture (SOA), simple object access protocol (SOAP), XML, REST (as a replacement or augmentation for SOAP) and OpenMAMA (middleware agnostic messaging API). Indeed, any wrapper interface technology with a call and response is a candidate for non-invasive interfaces to existing systems."

Implementation scenarios

Early rewards for investments

Regarding possible implementation scenarios, we agreed that implementation can start "on a large scale" and move toward more fine-grained implementations over time. This means that management can expect early rewards for their investment and an expectation that their systems will grow, leveraging every previous step.

“Grow Live” approach

It is entirely possible and even advised to apply an approach that I branded as the “Grow Live” approach. Possible scenarios include :

- implementation per domain
- implementation per duty of care
- implementation per entity
- implementation per function
- implementation per solution
- custom implementation
- implementation as a service by a trusted party.

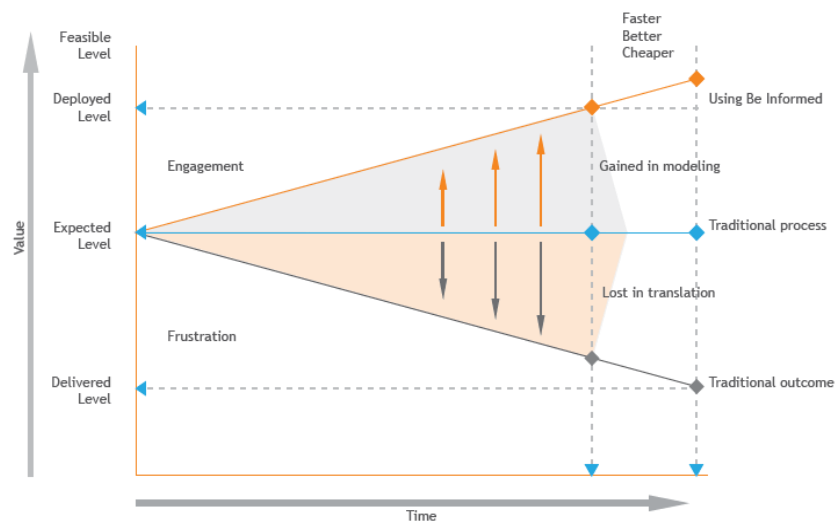
Never lose anything

John stressed the fact that, unlike competing alternatives that use rapid prototyping as throw-away proofs of concept, Be Informed never loses anything that is operational; it builds on it.

- No programming of code
- No flow charts or swim lanes
- No waterfall documents for requirements, specifications and code
- No more separate modeling tools and file formats.

Put an end to the critical frustration factor

Figure 21: From frustration to engagement



Source: Be Informed, Thei Geurts, 2013

The traditional frustration factor that business requirements are compromised in delivering an application can be turned into an engagement factor. Modeling with Be Informed stops the endless translations of requirements with all their negative aspects. The outcome delivers more value, and even

provides the insight into what is more possible with Be Informed.

The conversation ends,
but the story continues

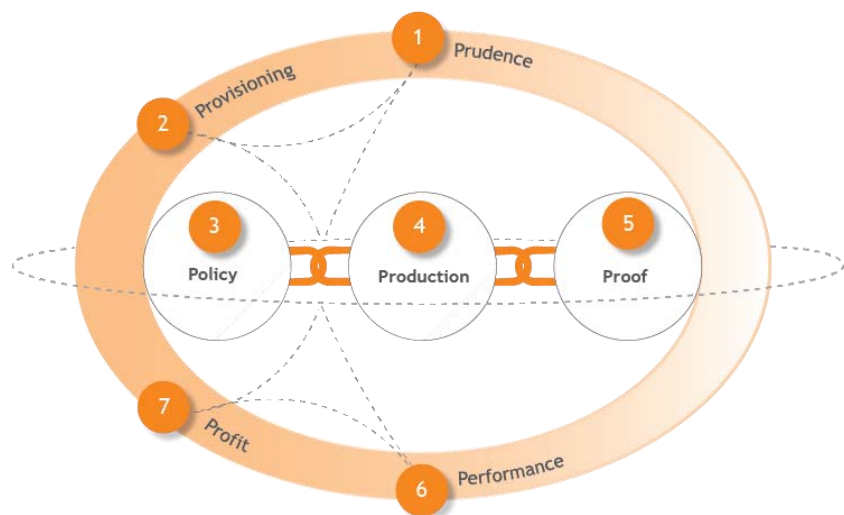
This was my final conversation with John. It turned out to be a very pleasant series of meetings in which we also discussed a broad variety of other topics. Because we didn't want to distract the reader from the connecting themes, we refrained from presenting them here. This is also why we streamlined our interview style to a very slim storyline without any flowery language and unnecessary elaborations. We sometimes also threw ideas back and forth, which were used in the narratives regardless of whom they belonged to. After bidding John a warm farewell, I left for the airport.

Connecting the dots

The 7P model revised

At the West Palm Beach airport, I had to wait for more than an hour for the flight to Atlanta. This gave me the opportunity to consider the meaning of what I had learned from my conversation partner in the first chapter. I once again took the presented 7P model and looked at all seven points. It turned out that they could indeed be connected now.

Figure 22: Connect the dots



Source: Be Informed, Thei Geurts, 2013

Figure 23: Your 7P model answers

- 1 **Prudence**
Create trust by providing timely and accurate information.
Augment transparency by offering compliance proof services to regulators and enable real time regulatory oversight.
Cooperate in certified self-control and meta-oversight constructs.
Provide impact proof about the effect of new regulations.
- 2 **Provision**
Set standards and use a 'comply or explain approach' for external provisioning services.
Engage in pre-competitive collaboration on standards, vocabularies and semantics.
Engage in GRC as a Service initiatives and fuse them with your internal system.
- 3 **Policy**
Create a GRC-intelligence position and enable ex-ante risk and impact assessment.
Develop and simulate scenarios. Model the business in context and from a goal oriented perspective incl. the defined risk tolerance.
Design for compliance.
Create one version of the truth and make re-use the norm. Manage the policy lifecycle by collaboration and embedded role separation. Capitalize on brainpower. Create a knowledge base to provide insight and support training objectives. Define ethic principles and integrate them in the control and certification cycle. Treat contracts as regulatory mandates and apply the same standards to them.
- I **Make procedures and controls executable.**
Offer GRC as a service.
Infuse context aware decision intelligence.
Plan coherent control and report activities. Enable virtual organization and collaboration.
- 4 **Production**
Execute preventive controls (manual and automatic) based on the infused intelligence and dynamic decision support.
Support collaboration, role separation and dynamic workflows. Apply monitoring rules, create alerts and offer integrated views.
Apply mass customization. Treat every request as a unique case. Create an audit trail, record the decision context with the applied controls, their origin and used rationale.
- I **Manage all case related facts in a unified case dossier including their decision context.**
Apply strict security and retention rules for dossiers. Enable gathering and merging of data based on metadata.
- 5 **Proof**
Provide role based dashboards and alerts.
Support continuous auditing, assessment and monitoring from multiple perspectives per case and cross-case. Generate reports based on reporting templates.
Support role based collaboration for monitoring, reporting, analysis, recommendation and remediation.
Use the case dossier for liability issues and smash cost of legal discovery.
Offer access to the knowledge base and provide information services for regulatory oversight.
Support ex-post impact and risk assessment and propose remediation.
- 6 **Performance**
Connect the dots and augment your GRC-capability.
Lever your logic to achieve transparency, sustainability & accountability within a risk aligned business performance.
Use a non-invasive business technology to support the business for various GRC-frameworks and to optimize invested capital in knowledge and systems. Use a robust platform. Apply a growing live approach. Start with removing a major bottleneck and optimize by re-use. Reduce legacy and cut compliance costs.
- 7 **Profit**
Result: You have built a GRC-intelligence position and created a high performance GRC-organization. This allows you to move more risks to tiers with lower financial thresholds, lower claim cost and free capital. You are compliant by design and can become a trusted partner of authorities. Your actionable GRC-capability and reputation grow by continuous improvement and engagement. New regulations offer new opportunities.

Source: Be Informed, Thei Geurts, 2013

All of my conversation partner's 7P concerns could now all be addressed and provided with an answer. In addition, the fragile transfer and connection points were replaced by antifragile connections.

We recommend transforming organically, starting by addressing the parts of the 7P model that constitute the largest burden, and employing your own preferred implementation scenario.

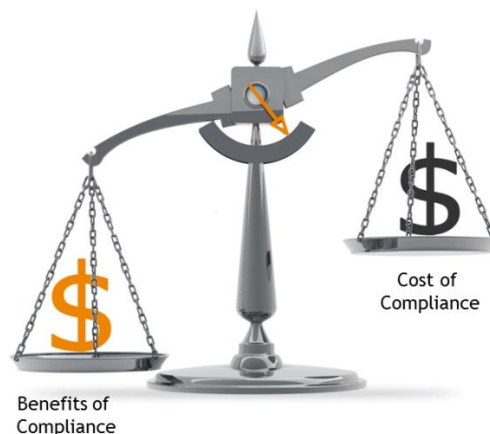
Making the business case

From increasing pain to
increasing gain

The business case for risk-aware thinking and action can now finally be made with ease. The curve of increasing pain can be replaced by a curve of increasing gain. We have sketched the value proposition and value architecture. There is a transformation approach that fits every organization at the enterprise or network level. The enabling technology is now available. Last but not least, there are also strong economic and regulatory drivers for change.

Major enterprises spend considerable sums on the implementation of compliance rules through the hiring of experts, manual maintenance, fines and wasted time. Three international banks we have interviewed estimate that, amongst other things, the cost of compliance in the U.S. alone costs them each in excess \$1 billion.

Figure 24: Shifting the balance



Source: Be Informed, Willem Dicou, 2013

We believe that through a service offering, enabled by the unique Be Informed technology, we can reduce the cost of operations over time to 1% of what it is today for both the business and the IT support infrastructure. This means more free capital to the companies for expansion, innovation and liquidity ratios.

Shifting risks to lower risk “baskets” frees up capital that can be invested and multiplied. All financial institutions are well aware of the multiplication factor that can be achieved.

Return on regulatory capital

A sound GRC environment can also be seen as a business benefit. There are many ways to generate return on your regulatory capital. Benefits include the following:

- Compliance costs can be reduced by up to 90%, thus creating a competitive advantage
- Straight-through processing (STP) as high as 99% increases cycle time, enables self-service and frees up time and attention for specific cases and new initiatives
- Case-sensitive risk assessment increases revenues: fine-grained judgments where every customer is a unique case
- Total insight and overview by using a single, integrated framework, allowing management to be in control
- Compliance is an asset of the organization, i.e. being compliant can be used as a brand differentiator: compare with “being green” in relation to sustainability
- Compliance as a service: use external services from expert companies rather than doing it all yourself; use intelligent outsourcing.

And besides that, “What is the risk and cost of doing something versus doing nothing?”

The future has started

High-performance GRC organization

In this publication, we intended to prove that the “future perfect” that is presented in the first chapter can now be realized. Proven technology is available. Concept computing enables you to leverage the semantic sweet spot, install a regulatory capability, and realize real-time regulatory

oversight. Interdependencies between frameworks can be surfaced, and topical regulations and policies can be executed in a coherent way. Risk management can be performed at a higher and more comprehensive level. New business opportunities arise. The board and all other stakeholders can look forward, and the whole enterprise can swing to the melody of continuous change.

Enjoy the music Your transformation journey has started. The final result for you will be a GRC intelligence position and high-performance GRC organization. You are compliant by design and can become a trusted partner of authorities. Your actionable GRC capability and reputation grow through continuous improvement and engagement. New regulations offer new opportunities and, through a systemic approach, your compliance issues are solved and future issues are prevented.

Appendix

Appendix: An Anthology of GRC Points of Pain & Solutions

Introduction

In this chapter, we offer an anthology of observations, points of pain in the GRC space, and solutions based on the vision presented in this publication.

Governance, risk & compliance (GRC)

The 2008 collapse
creates a
new market opportunity

In the early nineties, U.S. former president Bush and then president Clinton changed the provisions of the Glass Steagall Act, which separated commercial banking from speculative investments. To cut a long story short, between this and the Gramm-Leach-Bliley Act of 1999, Wall Street created risky speculative products that arguably led to the financial collapse of 2008. Since then, instead of reinstituting the banking regulations that prevented such speculation and risk for investors and savers alike, the U.S. government has responded with rapid-fire regulations intended to control the actions of the financial communities.

A global problem with
systemic
consequences

Because the collapse affected so many institutions on a worldwide basis, governments around the globe began to create regulations to mitigate the risks associated with financial investments. Moreover, larger banks have become systemically important financial institutions (SIFI) that need to be protected from failure due to the systemic effects any collapse would have on the financial integrity of world markets.

Confusion breeds more
opportunity

There are discrepancies between global regulations, regional regulations and local regulations. This creates an opportunity for regulatory arbitrage.

Overwhelming
regulatory change

Worldwide, an estimated 14,000 regulations have been left unimplemented by the regulated institutions, and the backlog continues to increase. This means that most, if not all, financial institutions are non-compliant and subject to fines. The question for many of them is whether they actually care,

In other words, what is the cost of non-compliance against the cost of implementation?

Goldman Sachs was fined \$550 million on an illegal transaction (after paying \$500 million in another settlement), which cost them 10% of their take - not a bad return on investment. Without effective measures, the risk reward trend may continue in this direction.

Management responsibility can mean jail time

The nation's five biggest lenders - Bank of America, Wells Fargo, JPMorgan Chase, Citigroup and Ally Financial - agreed to a \$25 billion settlement with the state and federal government after a sixteen-month probe into their mortgage activities.

Overwhelming cost of compliance

Notwithstanding, the risk to management of personal fines, imprisonment or, at the very least, industry censure remains, and is a personal pain point for the C-level executive. This is also why paid-for directorships are being passed over. The risk is not worth the money, especially if the actions of staffers, which is out of their control, can affect their freedom.

Reducing the cost

Each financial institution is an island of activity, with each island repeating and replicating GRC activity. On average, the cost to the major financial institutions can be in excess of \$1 billion annually.

Looking for damage done

There is an opportunity to aggregate this risk and provide GRC as a service. This could reduce the operational cost of compliance by circa 70% through economies of shared services. Further savings could come from mitigated risk losses, reductions in fines and censure, and, more importantly, protection of brand, reputation and customer trust that has a direct impact on stakeholder value.

Compliance as a service

Centralization provides control and reduced cost

- Centralization of internal and external regulatory processes and provision as a service to revenue generators, service departments and external customers
- Generation of revenue or cost transfers from regulatory control
- Provision of regulatory arbitrage services.

Special trading opportunities

No worldwide agreements on regulatory controls	Worldwide regulators will not agree on global regulations for at least five years. This causes confusion and delays GRC implementations.
Where there is confusion, there is opportunity for profit	This will continue unless a worldwide collapse occurs and financial control is moved from sovereign territories to global institutions such as the World Bank or the IMF; moves already reflected in Greece and Italy with European Central Bank interventions. Transaction tax threats are moving institutions to more “friendly countries”.
Providing compliance and business opportunities	<p>This means that an opportunity exists for financial institutions to perform transactions that are illegal in one sovereign territory and legal in another with less-stringent rules.</p> <ul style="list-style-type: none"> • No settlement of anomalous regulation for at least the next five years • Practices restricted in one jurisdiction may be permitted in others • Allows markets to work freely (for the time being) • Opportunity for competitive advantage and revenue generation. <p>This arbitrage opportunity is a revenue-generating activity that will appeal to the business (trading units) and not necessarily to the compliance officers, unless they are able to maintain regulatory and risk compliance at the local level.</p>

Best practices

Shortage of skills	A developing shortage in skilled compliance officers makes the development of best practices a growing problem. Integrators and audit firms are providing subject-matter expertise at premiums.
Knowledge archiving	<p>Be informed represents an opportunity for these businesses to archive and distribute knowledge models with best practices incorporated into the concept models. In addition, the best practices can be context-driven at the role-relationship-responsibility level, where they are needed.</p> <p>This provides a consistent and repeatable solution to assure compliant activity in all aspects of operations.</p>

Lack of control unit by unit	A lack of control by management causes fractured compliance functions. Some business units operate better than others. IT may or may not be integrated into the mix even though they need to be. Islands of responsibility breed “I’m OK” attitudes.
Reductions in overhead and opportunity lead to losses	The argument for cost reductions is based on several factors: reduction in the need for specialized services (consultants), reduction in the cost of IT implementation, speed of application, improved client services (revenue generation), reduced risk, reduced or eliminated cost of non-compliance.
Manual systems cannot keep pace	Continuing delays in checking for compliant behavior and manual systems mean there is a real risk of non-compliant transactions and losses of opportunity.
Straight-through processing facilitates more business transactions	With real-time compliance processing, STP is facilitated with only exceptions surfacing for human interaction. In addition, forensic audit can be eliminated over time. <ul style="list-style-type: none"> • Change rules “in flight” • Prepare for and model future rule implementations for execution on the day of the required change • Model impact of rules on processes, systems and business practices.
Change means delay and increased risk	When a change in regulation occurs, the delay in its implementation exposes the business to fines, censure and management risk, not to mention the potential loss of revenue.
Rapid change maintains business continuity	The ability to change rules “in flight” means that when exceptions are surfaced, they can be changed within minutes, as opposed to days, months or years. This represents a seachange in the ability to be compliant.
The unknown can be scary	Predicting the impact of change for any organization is difficult and arcane at best. What effects regulatory change will have on management, customers, revenue and operations is a risk factor that has unpredictable consequences.
Testing the effects of regulatory change in advance promotes planning	The time-based rule implementation allows all future rule implementation to be carried out on the scheduled date. Furthermore, the effects of rule changes can be modeled, and prices adjusted in line with risk. <p>In other words, the enterprise can know the cost of compliance in financial, human and operational terms in advance of the change.</p>

IT compliance integrated with business compliance

IT has its own problems	IT managers are subject to numerous regulatory controls, such as data privacy, security, data transport and recovery. IT managers are under increasing pressure to assure that current systems are compliant, and are reluctant to add new technologies in the face of such pressures.
The business suffers	<p>The integration of these pressures with business management pressures increases risk on both sides. Operations are stultified by fear. Above-the-line processing satisfies all operational requirements:</p> <ul style="list-style-type: none"> • Above-the-line processing does not interfere with IT systems and compliance processes • Real-time journaling of all systems and data accessed across multiple networks • Real-time assurance of appropriate geographic system traversals.
Even the IT systems can benefit from models	<p>The same integrated inference mechanisms that provide business rule compliance can provide integrated IT controls. Real-time journaling of all systems and data accessed by users, applications and subsystems can be monitored and controlled by model-based applications.</p> <p>With global compliance, rules concerning which networks are traversed by data can also be modeled by Be Informed systems.</p>

Assuring compliance

“Really, officer? I didn’t know that was a non-compliant activity”	One of the pain points for compliance officers and management is the risk of being non-compliant without knowing it, or, being compliant with one rule that conflicts with another.
“Which rule would you like me to use”?	The inference engine of the Be Informed environment together with the models can surface anomalous rules. This is especially important in global activities where laws such as Dodd-Frank may be in conflict with Basel, the UK FSA, and any other local jurisdiction.
Regulatory choices can be made	Once surfaced, a rule choice can be made. It may be based on risk choices, transactional activity or opportunity. Whatever the choice, the justification can be produced for regulatory

audit together with the choice definitions. Such choices can be institutionalized and allow straight-through processing.

International compliance

They are not just moving the goal posts... they are moving the playing field

The lack of clarity when it comes to regulations also puts businesses at risk when trying to ascertain which rules and/or regulations to apply. International transactions are especially difficult.

Choosing which regulation is especially important when trying to understand which body is regulating the activity.

- International regulatory controls
- UK FSA, PRA, FCA or all three?
- International compliance with FACTA by IRS
- FSB has new authority through IMF and G20.

Sorry about losing the \$2 billion

Knowing or choosing regulations on a global basis can have direct bottom-line implications.

Assessing compliance functions and surfacing anomalies is also a key capability of Be Informed.

Management can be in control of regulatory choice.

- Regulatory compliance or internal compliance
- Local, trans-national, or global compliance
- Improvement of investigative functions
- Rapid response to new legislation or approved regulatory imposition.

Governance - the G in GRC

Management are expected to know everything

No director or management executive can be expected to understand every regulation and policy that drives governance requirements. Notwithstanding, they are held accountable and liable to censure, sanctions, fines and even imprisonment.

Be Informed can assure management that all operators utilizing the Be Informed implemented models are not only compliant, but also able to prove it. The addition of real-time capability also allows management to predict problems before they become crises.

**Run the business, not
the rules**

In other words, they are not only operating correctly, but are known to be operating correctly. This can reduce the impact of sudden regulatory audits or “gotcha” thinking. This means that the business executives can concentrate on running their business to drive revenues and stakeholder value.

- Improved supervision and oversight for management executives with real-time regulatory oversight capability
- All outputs of corporate governance are coherent and consistent with full reasoning chain; here’s what I did and why
- World-view best practices modeled and useable by mere mortals
- Documented qualitative and quantitative processes - complete histories of all activity.

A key requirement of senior executives is to assure compliance at all levels within the enterprise.

Executive and board awareness

**Watching the business,
not your back**

A key problem at the board-of-directors level is that they are responsible both professionally and personally for the activities of their regulated businesses. Giving them the tools to assure compliance allows them to focus on growing stakeholder value while avoiding the pitfalls of unknown and complex rules.

“Line of sight” management is not limited to regulatory controls. BI can provide full business management reporting on customers, risk profiles (both internal and external) and human resource activity at the business and IT levels. Management reporting can also include all IT services to assure optimal operational support for the business units.

Seeing beyond the horizon

What’s next?

Management cannot predict the systemic effects of regulation on their business. Nor can they predict the expanding perimeter of regulatory incursion into their business. They are already being asked to prepare for an unpredictable future.

How fast can we adapt? What are the consequences for operations, revenues, stakeholder value if we can't?

- Ready to adapt to increasing regulatory perimeter (credit agencies - hedge funds)
- What's next? Shadow banking, payments and clearing?
- Tracking of FSB regulatory regimes; modeling and preparation
- Recovery and restitution planning and stress testing
- Real-time systemic risk analytics
- Closer regulator cooperation.

Technology impact

An expected paradigm ahead of its time

Concept computing uses semantics and executable models tied to inference engines to deliver rapid processing capability associated with rules.

- Meaning derives from networks of relationships between concepts
- Modeled separately from IT systems.

Concept modeling is a new way of creating support systems that does not use traditional computing analysis and design models.

A paradigm shift for IT executives

I know what a rules engine is

Much more than and different from a rule engine.

- The model is the design, is the documentation is the application, is the user interface
- The model is the application: at every stage of development, the model executes "Growing Live"
- The model self-documents, and explains decisions and actions
- Change devices, channels, or the models, and the system behavior changes automatically.

Value what was good in the past, and embrace what the future holds

No old ideas: flow-charting, orthogonal design, coding and modeling all cost time, effort and money.

The BI "be structured" technique of implementation assures rapid implementation without the wasted efforts. This translates into bottom-line savings and top-line productivity.

- Modeling allows mere mortals to produce functional models that work

- Business-specific, not code-dependent
- Multiple user-friendly modes of development: graphical, forms, spreadsheets and controlled natural language
- Natural expressiveness that is machine-computable.

IT becomes a service function as it was always expected to be

Implementation of Be Informed concept models can be designed and developed by subject-matter experts. There is no need for IT professionals to provide anything other than services. This moves the productivity to the business units, without them having to operate their own infrastructure.

Smaller is better

Sometimes a small group of special forces can do more than a brigade of soldiers

- Smaller functional teams
- Development is two to ten times faster
- Reduced risk
- Integration with existing systems is non-invasive
- Development is iterative and executable in all phases
- Deployment is incremental.

Unlike conventional analysis, design, programming and implementation strategies, concept modeling allows faster access to productive processes through gradual implementation.

Whoops, let's start over

This reduces the risk found in conventional systems that commonly occurs when a “whoops” moment happens. Some dependency was overlooked and the system needs a complete and systemic redesign.

- Operating costs 30% less
- Cost of ownership 60% less, and time to make changes and adapt 90% less
- Changing models is easier than rewriting code and far less costly to manage and maintain.

The results speak for themselves. Be Informed customers report reductions of 30, 60 and 90% in operating costs, total cost of ownership, and most importantly, the cost of change, respectively.

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About the authors

John Coyne

John Coyne directs worldwide financial markets and business innovations. He is a leading technologist with experience as a software executive, inventor, industry analyst, and developer of transformative business innovations. John is a published inventor with multiple patents issued and pending in advanced technology, devices, systems, and methods. In high technology, financial services, media, and defense industries, he has developed innovations that have transformed assets and business performance. He led the Financial Services Genome project that articulated the first comprehensive model of modern financial services.

Thei Geurts

Thei Geurts elevates the support for knowledge workers in heavily regulated industries to a higher level. He helps organizations to close the gap between strategy and execution and realize an actionable regulatory and governance capability. As an innovative thought leader, business developer and consultant, he creates solutions that make knowledge and information more easily accessible, assessable and actionable. Thei has directed and initiated a wide range of innovative products and services in the public sector and industry. He also created a workplace for policy-makers to support policy making in the 21st century. Thei is the author of publications on knowledge productivity, policy-making and embracing complexity.

About Be Informed

Be Informed is an internationally operating, independent software vendor. The Be Informed business process platform transforms administrative processes. Thanks to Be Informed's unique semantic technology and solutions, business applications can be made completely model-driven, enabling organizations to adjust immediately to new strategies and regulations. Organizations using Be Informed often report cost savings of tens of percents. Further benefits include a much higher straight-through processing rate, leading to vastly improved productivity and a reduction in time-to-change from months to days.

